



White-eyed Buzzard

Zaheer Bakshi



Black Francolin

Zaheer Bakshi



# CHEETAL

JOURNAL OF THE WILDLIFE PRESERVATION SOCIETY

ESTB: 1958

APRIL 2017-JULY 2017

Website: [www.wpsidun.org](http://www.wpsidun.org)

Vol 54 No 01 (2017-18)

ISSN: 0528-9122



Brown-Fronted Woodpecker

Abhai Mishra





Lesser Golden-Back Woodpecker

Abhai Mishra



Verditer fly catcher

M.. Thomas



Lesser Yellownape Woodpecker

Abhai Mishra



Egyptian Vulture

Erik Thomas



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### Editorial Board

Dr. Dushyant Gaur, Air Cdr. Amul Kapoor,  
Dr. S.P. Singh, Mr S.S. Khaira

## FROM THE EDITORIAL BOARD

Dear Friends,

It has been stated by the wise, learned and intelligent, that there is one thing which is constant and that is "CHANGE". However, they had added that change, if any, which is inevitable, must be for the good of mankind and God's other creations. Also, it had been stated, that not adapting to changing times and reinventing procedures, policies and operations will prove disastrous to mankind. This prediction of theirs has been proven to be very true.

Over the years, 'Cheetal' has also gone through various changes in its format, layout and content, in order to achieve the best possible expression of the Philosophy behind the establishment of Wildlife Preservation Society (of India), way back in 1958. In accordance with the ruling of Indian Government, a Non-Government Organization, like our Wildlife Preservation Society, cannot use India as a suffix or prefix in its name. Hence, as most of you must have noticed, from now on, ours will be known as Wildlife Preservation Society, or WPS.

It is amazing to observe that in spite of the strides mankind has taken in terms of acquiring knowledge, education and awareness at a social level; and the advancements in science and pharmaceutical industry has grown in the past century, a certain population of the world still seriously believes and craves to consume indigenous and traditional, albeit non-standardized and crudely extracted substances or 'medicines' from the body parts of wild animals, in order to treat their various ailments! Also, the inherent, pre-historic trait of procuring clothing and goods prepared from animal skins and body parts, particularly ivory, is showing no signs of extinction. These inexplicable and illogical traits and beliefs transcend the barriers of nationality, race, economic development, customs and traditions, fueling the illegal trade of wild flora & fauna of the world. Weak political will and outdated laws and judicial machinery has further aggravated the threat to our natural resources, playing havoc on our rich natural wealth, particularly in terms of the constant extinction of flora and fauna from the face of earth.

Hence, as members of WPS, if we can take it as our prime responsibility, to spread awareness and dispel myths and false beliefs surrounding the consumption of substances or 'medicines' sourced from wild animals, we shall be fulfilling our prime duty towards the preservation of the natural wealth of our Nation as well as the world. The youngsters of the society should be our target because they are the ones who will inherit this world; if we can inculcate in them the wisdom to respect every life that exists in nature, we can hope that our future generations will be more rational, logical and sensitive towards the preservation of this earth's natural wealth. This utopian task, though of mammoth proportion and virtually impossible, can be turned in to a positive change if we take 'baby steps' at an individual level, and make our sincere contribution to turn it in to reality.

**Editor**

## MESSAGE FROM THE DESK OF THE EXECUTIVE VICE PRESIDENT

“Greetings to all members”. It gives me great pleasure to give a brief account of activities that have taken place ever since the new Executive Body took charge.

The Annual General Body Meeting was held on 15<sup>th</sup> Nov 2015 after which elections were held, Mr Vinod Rishi I.F.S. Retd. ADG (Wildlife) was unanimously elected as President of WPSI. There was slight delay in handing over charge by the previous body. Things fell in place by January end.

The first work to be taken up was white wash and painting of the office building which gave the office a presentable form. I would like to thank Mr Narendra Singh (Secretary) and Mr Abdul Aziz for all the effort they put in.

On 14<sup>th</sup> Feb 2016 a wildlife tour to Jhilmil Jheel was organised. Our Vice President Mr Rajeiv Mehta hosted the members and took us around. The tour was attended by 15 members.

Mr Vinod Rishi stressed the need for a Projector and Laptop for the society. The procurement of the projector brought about a complete change and fulfilled the primary “Aim and objective” of the society which is “to promote interest and impart knowledge regarding the preservation and conservation of all forms of wildlife”. A number of new members joined the society. Mr Rishi stressed the need for issuing Identity Cards and Membership Certificates to all the new members. Some members who had misplaced their old ID Cards or who wished to get new ones made sent their details and were also issued fresh ID Cards.

**On 08 May 2016** : A talk and slide show on wildlife photography was held. The speaker Dr Tarun Sharma, an orthodontist by profession gave an enlightening talk on the basics of photography and showed some breathtaking photographs. He was honoured with a memento by our president Mr Vinod Rishi. Dr Tarun later became our life member. Twenty four members attended the meeting. I would like to thank Mr Mansoor Mazhar for designing and fabricating Mementos for the Society. They have been much appreciated and well used.

**05 June 2016** : Environment Day-A talk on rescue and release of leopard from Meerut city was delivered by Mr Sushant Sharma I.F.S. during his tenure as D.F.O. Meerut. Mr S.S. Khaira, a new member spoke about the A to Z of a healthy life so that we leave behind minimum carbon foot prints. Mr S.N. Mishra and Mr S.K. David distributed lychee saplings and spoke about the importance of cleaning the river Ganga and its tributaries. Mr Vinod Rishi thanked the speakers and gave the mementoes.

**03 July 2016** : A talk and slide show on philately and postal stamps related to wildlife was delivered by our member Mr Abhay Mishra. Twenty two members and five children (guests) attended the talk. Mr Mishra also spoke about his trip to Antarctica.

**07 August 2016** : A talk by Dr Pradeep Malik from WII was held. Dr. Malik spoke about reintroduction of tiger in Sariska National Park. The talk was an eye opener and Dr. Malik dwelled upon the future of tigers in India and the challenges in saving them.

Due to health and personal reasons our President Mr Vinod Rishi resigned. His resignation came as a great loss to the society. A void which can not be filled.

In October 2016 the society celebrated “Wildlife Week” with great pomp and show in

association with UCOST. I would like to thank our member Mr Pankaj Shah and our Patron Mr Rajendra Dobhal U.C.O.S.T. for organising the event. Inauguration of Wildlife Week was held on 1<sup>st</sup> Oct 2016. The speaker Mr Vibash Pandav from WII gave a talk on man-animal interaction and growing Rhesus monkey problem. The function in UCOST included tree plantation programmes and talks by Mr Vinod Mathur. Director WII and Mr Jairaj I.F.S. PCCF. UKFD. A number of members attended the function and a bus was hired to take the members to and fro from UCOST Jhajhara. A special thanks to Mr Sanjay for getting a car load of saplings from Lucknow and planting them along with those procured by WPS.

The Society also organised a painting and essay writing competition for ten schools. The winners of both events were awarded trophies and certificates. The closing ceremony took place in Col Brown School on 7<sup>th</sup> Oct. A tree plantation drive and a quiz contest was held on the last day. Since the official closing ceremony of Wildlife Week was 8<sup>th</sup>, a number of members attended the function organised by the Uttarakhand Forest Dept. in Lacchiwala which was graced by the Chief Minister.

Mr Mansoor Mazhar our member from Moradabad organised a trip for thirty school children belonging to Rampur, Meerut and Moradabad on 02 Oct 2016. A bus full of students went from Moradabad to Ramnagar on a day trip. Recently Mr Mansoor and Mr Samuel Singh, our members from Moradabad, rescued and released three leopard cubs from villagers along with U.P. Forest Dept. Officials.

**04 Dec 2016** : A National level conference was held in UCOST on man-animal conflict. A number of WPS members attended the conference. The programme was attended by the Chief Wildlife Warden Mr DVS Khati I.F.S. and senior forest officers.

The registration of our Society, which was long overdue has now been done. In accordance with the new government ruling the society will henceforth be called "The Wildlife Preservation Society".

I would like to thank Mr Pankaj Tomar our Life Member for organising a talk on his trip to the National Parks in South India and screening two documentaries during our monthly meets. One on Climate Change and the other on Wildlife. Both documentaries were well appreciated by our members.

A special thanks to our member Mr Digvijay Singh from Uganda for delivering a fantastic slide show and talk to the students of Olympus High School on Africa and its rich wildlife.

**05 March 2017** : A talk and slide show was given by Dr Saket Badola IFS DFO, Mussoorie. Dr Saket spoke about his tenure as Deputy Director. Corbett National Park. More than thirty members and guests attended the talk. Dr Saket also released two books in hindi "Bharatiya Baagh" and "Mount Everest Ki Gatha" written by our member Mr N.C. Madhwal.

I take this opportunity to welcome all the new members who have joined WPS and would like to extend a special thanks to Shri RK Shukla IFS (Rtd), one of new members, for his initiative in getting articles for the WPS Journal.

Apart from the Members of the Editorial Board I would also like to thank our Life Members Mr. Puneet Kaura, Zaheer Bakshi and Patron Arjun Balraj Mehta , for their support and help in coming out with this issue of Cheetal.

In today's digital age, the need of the hour is to improve our Website. Much work has to be done in this respect. The present issue of Cheetal is available on the Society's web page. I strongly recommend and urge the members to go through it. It is much more vibrant and colourful.

It will be our endeavour to conduct elections later this year when our Governing Body completes its two years tenure.

I would like to thank all office bearers and members for their cooperation. There is a lot more we can do together as a team. May the Society rise to greater heights.



**DR PRASHANT SINGH**  
**EXECUTIVE VICE PRESIDENT**

## **TIGER CONSERVATION AND CLIMATE CHANGE**

**Shri Ajit Sonakia IFS (Rtd\*)**

The Tiger being a symbol of Power, Strength and Beauty has left its impressions from prehistorical cave paintings, Hindu mythology to the science of nature conservation. During the present period protecting Tiger symbolized protecting the nature. As the Tiger exists on the apex of biological pyramid, protecting Tiger also means protecting the biological pyramid on which its life depends. The existence of Tiger in an area indicates that the ecosystem existing there is ecologically balanced. It also means that the forest is healthy and full of its natural prey. The existence of natural prey in turn depends on availability of food, water and shelter.

During the recent time tremendous increase of biotic pressure is observed on such forest areas which earlier supported Tiger and its prey base. These biotic pressures include human settlements, timber collection, cattle grazing, mining and areas for cultivation. Because of these biotic pressures the Tiger habitats are depleting and disintegrating. As a result of this destruction of Tiger habitat, their number is also declining to a stage where its very existence is under threat.

Under the present circumstances serious and sincere efforts are necessary to save the Tiger from becoming extinct. It is quite likely that some of these efforts may appear to be quite far fetched and wild in nature. But the time has come when we have to take some drastic actions to save the Tiger. These drastic actions may include Providing corridors, Changing land use pattern in and around good Tiger areas and Protected Areas. Resource mobilization will be biggest constraints in the implementation of such drastic action plans.

The phenomenon of Climate Change due to Global Warming is threatening the very existence of life on this planet. Under the aegis of United Nations Frame Work Convention on Climate Change global efforts are being made to reverse the trend of Climate Change.

Seven subspecies of *Panthera tigris* are reported world over Which are; Siberian Tiger, Sumatran Tiger, Royal Bengal Tiger, Indochinese Tiger, South China Tiger, Malayan Tiger, Caspian Tiger, Javan Tiger and Bali Tiger. During their glorious past the approximate number of all the individuals was 100000. Their spread was from Eurasia and Caspian Sea to south Asia and far east to Java and Sumatran islands. But due to destruction of habitat, loss of Prey base and poaching their number declined drastically. The 2016 estimate is around 3800 to 3900. This decline has taken place during last 130 to 150 years. This is the period which coincides with the advent of Global Warming and Climate Change due to anthropogenic activities on the planet Earth. Forest were cleared extensively to make way for human development activities leading to increased Green House gas emission. Ofcourse the contribution of GHG emission from industrial development was always very high but forestry sector paid a heavy price for many industrial activities.

The Tiger being at the apex of Biological Pyramid, it suffered the most. Its home range and territory were lost and so also the prey base. Its increasing dependency on cattle brought it in direct confrontation with human population. Man - Animal conflict was also an outcome of conflicts regarding ever increasing human activity in forest area, which was its home.

This scenario impacted the Issue of Global Warming and Climate Change and Tiger survival simultaneously. But the issue of Tiger conservation did not receive the adequate attention. United Nations Organization after much deliberation at Rio Earth Summit in 1992



started global efforts by forming United Nations Framework Convention on Climate Change in 1995. During the last 22 Conference of Parties, Tiger Conservation was never taken as a priority issue. In fact the issue of forest conservation also was never a priority issue during COP discussions.

Actually, the philosophy of human dominance was in the core of all such strategies to save the planet Earth. Almost always an argument is given to ridicule the issue of Tiger Conservation is “Who comes First, Man or Animal. Who has the first right to live, ignoring the fact that Homo sapiens are one amongst the million-other species which inhabit the earth and all have equal right to live.

If we human beings climb down a little and think about giving some space to the issue of Tiger Conservation in our overall strategy to save the planet earth from the adverse impact of Climate Change, then we can hope for a better future for the besieged Tiger Population of the Asian region.

During the COP 21 at Paris a historic Paris Agreement was signed and has been ratified by 137 countries out of 194 signatories. The two important points needs mention here. The first point is that our Prime Minister has committed that India will take up Plantation Projects to reduce 3 billion ton of CO<sub>2</sub>e emissions. The huge plantation drive will help reduce biotic pressure on already overburdened natural forest being home of Tiger population in India. It will also be an important adaptation measure. It will also help reduce the Man – Animal conflict. The second most significant achievement of this agreement is the establishment of Green Carbon Fund. Part of help from this fund will be allocated for forest conservation project around the world and Indian forest and Tiger will definitely get benefited. Therefore resources from Green Carbon Fund of Climate Change program can be used for Tiger conservation in India. The efforts may include: -

1. Changing land use pattern upto 5 km from the boundary of a National Park and Sanctuary.
2. Changing land use pattern upto 5 km from the boundary of Good Tiger Habitat.
3. Changing land use pattern inside a National Park and Sanctuary
4. Changing land use pattern inside Good Tiger Area.

This may call for acquiring or compensating the Tribal or Nontribal land owners in such an area. If a farmer or a resident wants to continue living inside such an area (except National Park and Sanctuary area) may be allowed to do so without causing any damage to the habitat which includes collection of MFP or Timber fuel, including ban on grazing etc. His residential area could be securely cordoned off to prevent the entry of wild animals inside the residential area. Due to land use change their food security will have to be ensured.

There will be some positive outcome of this initiative like the Tiger habitats will get enriched and Tiger population in the country will be revived. There are some negative points also which should be kept in mind before taking up such a project

1. Excessively high funding will be required.
2. Free sitting individuals in such areas may opt for poaching activities.
3. Problem of increase in population over the years.
4. Life style is cattle based, where these cattle will go.

5. Where from dedicated personal will come for all these works.
6. Yearly payment of cattle kill compensation will have to be ensured.
7. Corruption in income and property values calculation.
8. Power centers will try to divert benefits to their close ones.
9. Power centers will try to use the scheme for their political benefits.
10. Some land holders will try to revert back.
11. These may result in legal court cases.
12. Loss of cropping area will result in reduced food grain production.
13. Problem of accommodating cattle from such affected area elsewhere.



The Author, **Shri Ajit Sonakia IFS (Rtd\*)**, is a retired Principal Chief Conservator of Forest, Madhya Pradesh. He has special interest in the field of Climate Change, is engaged in making PPT presentations in schools and colleges to spread awareness amongst the youth.



**Tiger**

**Yashwant Bhinai**



## RAREST OF RARE ENDANGERED HERB *EREMOSTACHYS SUBERBA* NEEDS SUPPORT FOR SURVIVAL

Dr. Y.P.S. Pundir

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*Eremostachys suberba*, is a perennial herb with a tuberous underground root stock (Photos 5 & 6), which sprouts in August – September. By the end of December it forms a beautiful rosette of large leaves (20-50cm) on a 5-15 cm long stem (Photo 7). The leaves resemble with the leaves of reddish, thus the plant is often referred as ‘*Jungle Moolee*’ by ‘*Ban Gujjars*’. In late December or in early January one (rarely two) flowering shoot develops in the middle of rosette of leaves. The shoot quickly elongates with a floral spike on its head and attains variable length 45-150cm by the end of coming February (Photo 8). Later from middle of March to end of the month, flowers develop in 8-15 verticillate whorls, each with 8-10 flowers. The flowers are extremely beautiful, 2.5- 3.0cm long, bilipped, and bright yellow in colour. The flower whorls are closely placed on a 10-45cm long spike which can attract any person from a long distance (Photos 1 & 2). Each fertile flower gives rise to four dark brown seeds which are dispersed in late April or in early May. (Photo 3)

*EREMOSTACHYS SUBERBA*, an extremely beautiful plant of Labiatae, was first discovered and described from Mohand and Khree Pass (Saharanpur Siwaliks) by Royle (1839) who wrote...: “this very showy and elegant plant I have only met within the Khree Pass on entrance from the direct road from Saharanpore (=Saharanpur) to Dehradun (now Dehradun). Introduced into botanical garden it became perfectly naturalized and truly ornamental”. King (1882), most distinguished botanist of his time, also remarked that this beautiful plant “is one of the best example known to me in India of a truly local plant”. Duthie (1903 -1929) also calls it an “extremely local and very handsome plant”. Moreover, the list of other important personalities appreciating the plant is quite long. With the discovery of this beautiful herb, although it attracted the attention of several botanists, unfortunately it was last collected from its type locality in 1879 by Duthie and later it became extremely rare. There are several reasons for its disappearance, which have been detailed elsewhere (Pundir, 2015). Only, after a long gap of 89 years, the plant was recollected from its earlier known type locality Mohand Pass, Siwalik hills (U.P) by Som Deva (1968). On the rarity of the species, Som Deva wrote that systematically exploring different tracts of Siwaliks for three years, finally he was able to locate a small population of plants in a secluded spot. Later Babu (1977) also reported the species from its type locality (now in RAJAJI NATIONAL PARK in Uttarakhand).

Thus in absence of adequate number of individuals (Ca. 100) in its type locality the status of the species in 1987 was reported as threatened in the ‘*Indian Plant Red Data Book*’ (Nayar & Sastry, 1987-1990). Later Rao and Garg (1994) found that “the population has drastically collapsed to hardly 25 plants in the type locality”. Thus they hurriedly concluded that the sharp decline in short span of time suggests that the **species might breathe its last in the coming 4-5 years itself if no effective conservation measures are initiated**. Therefore, there is an urgent need ‘to see that the population is drastically multiplied so that the effect of demographic stochasticity... are counteracted. For assured long-term conservation one has to workout strategies that can increase the genetic diversity, but in this species the genetic diversity cannot be induced for want for any other population within the range of the pollen or seed dispersal. The current status of the population near Domel is not

known. If these two populations could be brought together by some means the chances of survival of this species may increase' (Rao and Garg, 1994).

However, with the discovery of a new *E. superba* locality, with a limited number of plants near Jammu by Koul *et. al.* (1997) it became possible to bring together these two populations i.e. of Mohand and Jammu (See Pundir, 2015).

Thus realizing the urgent need to conserve this species work was started in 1997-98. The area was extensively surveyed from base of Siwalik hills from Mohand Pass to 'Dat Kali Mandir'. The secluded spot, which lies just on the road side on Saharanpur – Dehradun road was seen with Ca 50 plants in a very bad shape, only few of them were with unhealthy inflorescences most of their seeds were bored by insects which failed to germinate in the nursery. Later in 1998 seeds of Mohand population procured from Prof. Som Deva's garden and a good number of seeds (Ca. 141) supplied to us of Jammu population by Dr. Kaul were sown in the nursery. In third year the young plants of both populations started flowering. After repeated cross pollination between two population individuals of different generations, in past years we developed several thousand plants. However, in 2000- 2001 Ca. 350 seedling of Mohand population were transplanted in Siwalik hills (Photo 7). Moreover, and appreciable number young plants were also distributed to several organizations, like Forest Research Institute, Dehradun, Botanical Survey of India, Northern Circle, Dehradun, District Forest Officer, Siwalik Range, Dr. Chandola, (Director) Herbal Garden, Rishikesh *etc.*, and with a long list of flowers lovers of Doon Valley.

Recently, in February- March 2017 we have transplanted Ca. 995 young plants of this species near two villages (Simyana and Palyali Gad) in Barlowganj hills, district Dehradun.

At present, we have more than 2000 young plants in the nursery for transplantation (Photo 4). As soon as we get permission (already applied for it) an appreciable number of young plants will be transplanted in close neighbourhood of the type locality of this species in Rajaji National Park, Uttarakhand. These young plants, with more genetic diversities than those of their Mohand (Dehradun) and Jammu parents, have better chances to survive in the changing conditions of the environment in the type locality of the species and its neighbourhood.

At several occasions, it has been emphasized by the author (Pundir, 2001, 2015) that the conservation by mass participation is the best way to save any threatened/ endangered species. Thus, we are waiting biodiversity conservationist and flower lovers of Doon Valley to join hands with us by growing some plants in their gardens; available free of cost from our nursery. So that, this endangered beautiful plant species may survive (Photo 9).

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### **About The Author**

Dr. Y.P.S. Pundir served as HOD Botany , DBS College Dehradun for 35 years. Worked on Western Himalayan Mistletoes, Ethnobotany, and conservation of threatened/endangered species. Successfully completed several major projects and published more than 100 papers and five books on conservation and mistletoes.

**ENDANGERED HERBS & PLANTS**



No 1



No 2



No 3



No 4



No 5



No 6





No 7



No 8

### Explanation of Photographs

Photo No. 1, 2, 3 & 5... *E. superba* plants in a residential garden.

Photo No. 4..... *E. superba* Nursery in early February 2017.

Photo No. 6..... *E. superba* spike in full bloom.

Photo No. 7 ..... *E. superba* : Tuber/ root stocks of a young plant and  
of an old flowering plant

Photo No. 8..... *E. superba* seeds.

**EXCERPTS FROM THE UNPUBLISHED DIARY OF A FIELD DIRECTOR  
OF A TIGER RESERVE  
SUHAS KUMAR IFS  
Former PCCF, Madhya Pradesh**

**Serious Notes- in a lighter vein - The VIPs, the Tourists, and the Field Director**

I am a Field Director looking after a tiger reserve in India; an employee of the Government of India, presently serving the state government in which my tiger reserve is located. As a Field Director (FD) my task is to ensure that the wild lands under my charge remain intact, the tigers and its prey are safe and thriving and the habitats that support the wild animals are productive and healthy. Sounds quite easy – isn't it? I too thought so initially when I got my posting order to serve at this reserve.

But now I have been engaged in doing things that hardly allow me time to concentrate on my primary task as a wildlife manager. At present, I work as a tourism manager and a Public Relations Officer - Oh yes, as a PRO who is high in demand. My phone rings 24x7 and most of the calls are from VIPs, their sons and daughters, *mausi ka ladka*, *samdhi – samdhin*, party workers, *khas dost* and each of these categories demand my personal attention. If I am at one entrance of the park seeing off an Hon'ble Minister, I get a call from the other gate 30 kms away that another VIP needs me there at once. I jump into the Scorpio and rush to be there.

Whenever the guests of a VIP arrive the rest house kitchen gets transformed into a *langar*; there are usually more than a dozen mouths to feed. And when my FRH in charge presents a bill, he is presented a mobile phone in return with the VIP on the other end of the line threatening dire consequences for displaying disrespect by presenting a bill to the esteemed guests.

Once, in my park, a young officer from Indian Administrative Service wanted to watch a tiger from close quarters. He insisted that he should be brought down from his perch high up on the elephant back and put down on the ground so that he could walk up to the resting tiger and look at him up close. The staff did not budge. The man created a ruckus after coming back and demanded my presence. When I reached there and explained to him the risk in following such a life threatening demand, he became furious and threatened me to wait and see as one day, he would become the Forest Secretary and then he would teach me a lesson.

On the other hand tourists are easier to manage. But the cost of managing tourism is high, as I have a small bunch of staff whose primary responsibility is to protect and manage wildlife and its natural habitat. These guys are totally at their wit's end when it comes to managing tourism; but do they have an option? The park is open for 9 months to tourists and for nine months I manage the park with half the strength as the other half is busy distributing permits, supervising toilets, monitoring errant guides and drivers, picking garbage from the tourism zone etc. The worst comes from the influential lodge operators. They want me to ask my staff to stop patrolling and maintenance works as they believe them to be disturbing the tigers in the tourism zone, and it inconveniences the visitors. Some want the entire park to be declared a tourism zone; some protest why the park should be closed for a half day every week. When I explain them that both the staff as well as the wild animals are living



creatures, and that they, too, need some time to rest and be in peace - they scoff at the idea. The poor guard, who lives in the jungle camp, is compelled to keep a separate accommodation for the family in a big village or small town 50-60 kms away as he does not want his/her children to remain uneducated. Obviously he needs a day off in a week to take care of the needs of his family. But those who empathize with them, and feel for them are me and my counterparts in other parks.

Sometime, at the entrance to the park I handle angry bunch of visitors who could not book a permit online and came to the gate to buy one as all the tickets were booked in advance by a few hotel operators in bulk and the 10 % allotted to the gates were utilized for accommodating the guests of the local VIPs including the high profile Govt. Servants.

Often, my staff feels helpless watching a number of vehicles parked on the road obstructing the movement of cubs across it to reach the glade where their mother is in wait for them. My helplessness emanates from the experience that fines imposed on errant drivers do not deter them from the bad practice and they do it again and again. I feel further helplessness when the moment I order a harsher punishment my phone starts ringing for withdrawing my order. I do not want to be reprimanded for no fault of mine. Gradually, I have become a thick skinned pachyderm, like a rhinoceros – I just keep my head down and do not want to see what happens around me.

Wildlife Management obviously has taken a back-seat. But am I worried? Not at all! I believe that even passengers sitting on the back seat would, at the end, reach their destinations albeit with some aching bones and an upset stomach.

### **About The Author**

Dr. Suhas Kumar, IFS, M.P. Cader, Batch of 1980. Worked in many capacities, PCCF Wild Life and others. Also at Wild Life Institute of India. Retired on 31 Dec 2015.

## ROGUE ELEPHANTS

**Shri Jayant Chandra Mardraj Harichandan**  
***Member, State Board for Wild Life, Govt. Of Odisha***

During the British Raj, killing elephants were never considered Sport in India, except by some tribal communities in south and north east India, but catching elephants was. In the 19<sup>th</sup> century this Sport was practiced in the Princely States of Korea and Surguja in present day Chhatisgarh and in Athamallick, Boudh, Keonjhar, Nilgiri and Mayurbhanj States in Orissa. This Royal Sport was also practiced in Nepal, where elephant shooting was strictly taboo on religious ground and in Mysore State. The Sahibs were the first to start shooting elephants as Sport, irrespective of age and sex. Later the official policy of giving a financial reward for the destruction of rogues, encouraged bounty hunting of elephants, especially in South India.

The Elephant Protection Act of 1879 banned Sport hunting of elephants in order to preserve a species that was important to the colonial Rulers as a National Resources of strategic importance. The 1879 Act was in course of time extended to Burma, mainly to prevent in discriminate slaughter of elephants by British Sports man. The Elephant Protection Act established government monopoly in the capture of elephants and also the Act recognized the destructive side of elephants and permitted, besides capture, the liquidation of the animal, for loss of human life and property.

The Elephants Preservation Rules (1953) was created in Orissa State, soon after the merger of 26 Feudatory States of Orissa (the main elephant bearing areas of the State) with the Indian Union. With very few Makhnas in Orissa, this precaution was obviously thought unnecessary. The Orissa Rules permitted a license to kill and capture elephants “in any manner, except in pits”, with disastrous results.

However, the Wild Life (Protection) Act of 1972, radically altered the previous Acts / Rules and the Indian Elephants was identified under schedule –I of the Act in August 1977, which permitted an elephant to be destroyed U/s 11.1(a) of the Act, only when it has become dangerous to human life or sick beyond recovery, but no longer for destroying crop or property.

The post 1977 scenario doesn't appear to be satisfactory. The main danger seems to be in retaliatory killing of crop raiding elephants by the affected people, in the face of Government's reluctance to act. The Director, Project Elephant, reported that, in 2002 while the figures of poaching for Ivory has decided, cases of killing by electrocution and poisoning has increased.



Human and elephant deaths and damage to crop and property are inter-related issues in the problem of man-elephant conflicts, one triggers the other! It is therefore, time to think and reconsider if elimination of selected animals is preferable, Modern scientific techniques can identify habitual rogues and confirm the killer from DNA fingerprinting of bodily fluids in dung. Thus, it is necessary to make a proper study of the alternatives available today and pursue to save the helpless animals against further killing and destruction without any valid reason.

### **About The Author**

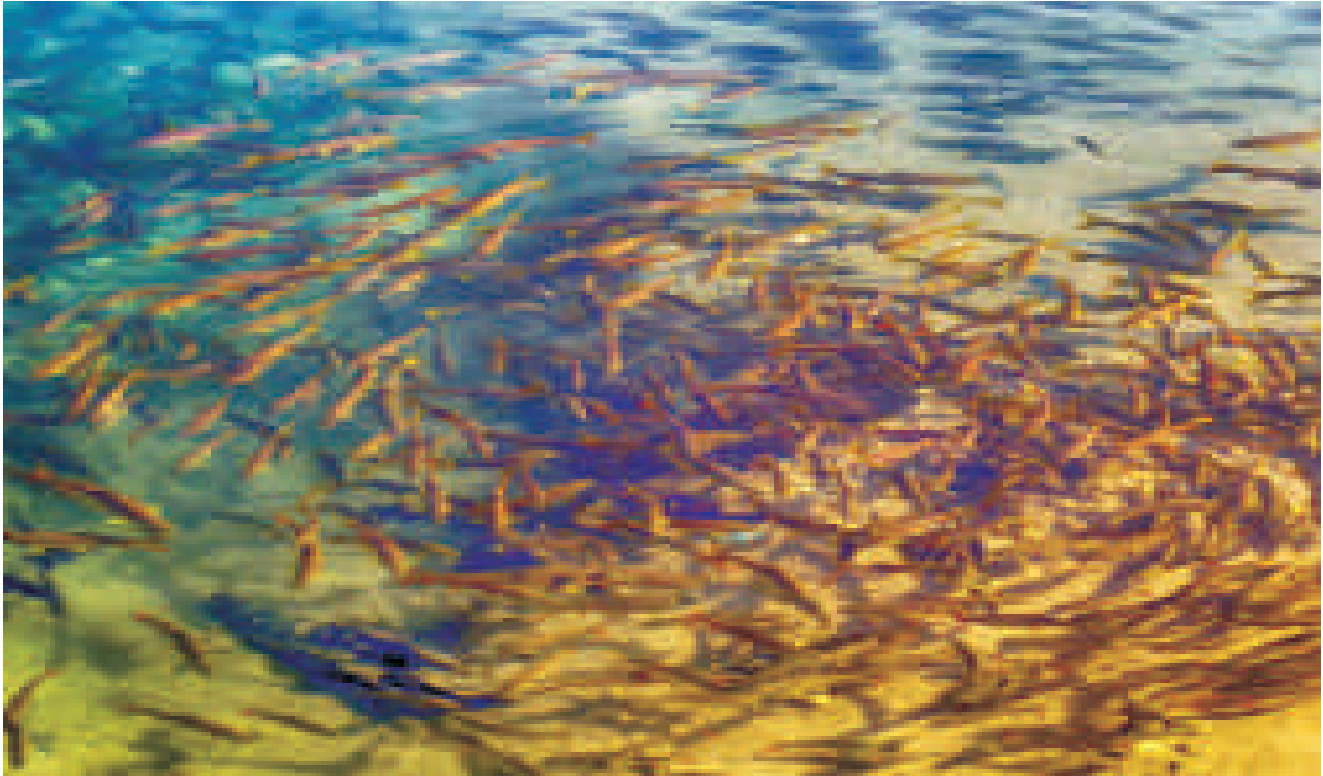
**Shri Jayant Chandra Mardraj Harichandan**  
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**MAHSEER CONSERVATION: NO LONGER A RANDOM HARVEST  
A REPORT ON A MEETING HELD AT INFINITY RESORTS,  
DIKHULI VILLAGE  
ON 08 APR 2017**

BY

DR. A.J.T.JOHNSINGH, NATURE CONSERVATION FOUNDATION, MYSORE  
WWF-INDIA & CORBETT FOUNDATION



The pool brimming with golden mahseer in the scenic Kosi River, protected by the staff of the Ramnagar Forest Department and Infinity Resorts, was the major impetus for the meeting of wildlife conservationists and law enforcement agencies on April 8, 2017, at Dhi-kuli village, Nainital district, Uttarakhand.

The meeting sought to create awareness and sensitize the people of Uttarakhand that if one pool with protection and a little feeding could support so much fish, then the mahseer rivers (c. 500 km) and the reservoirs (Tehri, Ramganga and Nanak Sagar) of the state can support a thriving population of fish, if the needed protection is given. An abundance of fish can be a great boon to the people of Uttarakhand as it can provide some amount of nutritious food and generate substantial revenue through catch and release angling which can be combined with homestays and ecotourism.

The meeting held at Infinity Resorts, Dikhuli village, on the banks of the Kosi River, was attended by nearly 100 people. Although Mr. DVS Khatri, IFS, Principal Chief Conservator of Forests and Chief Wildlife Warden, could not attend the meeting due to unavoidable reasons, Dr. Dhananjay Mohan, IFS, Additional Principal Chief Conservator of Forests, Wildlife, ably led the meeting.

The participation of Surendra Mehra, IFS, Field Director, Corbett Tiger Reserve; Amit Varma, IFS, Deputy Director, Corbett Tiger Reserve; and Neha Varma, IFS, Divisional For-



est Officer, Ramnagar Forest Division was encouraging. The presence of senior police officers Ajay Rautela, IPS (DIG, Kumaon Range) and Sunil Dhyani, IPS (DIG Sashastra Seema Bal (SSB), Almora) was a source of added support and encouragement. They assured us that the mahseer pools close to their stations would be protected.

Dilip Khatau, Chairman, Corbett Foundation, welcomed the gathering and Ravi Singh, Secretary General and CEO, WWF-India, spoke about the threats posed by the introduction of exotic fishes to the native fishes and assured us that he would provide the needed help required to strengthen mahseer conservation. The highlight of the meeting was the unanimous agreement that the mahseer in Uttarakhand should be protected in order to save the species and to benefit the local people. Ajay Rautela assured us that the police will crack down on the use of dynamites to kill fish. The author (AJTJ) made a plea to the people of Uttarakhand not to get into the ecologically harmful practice of idol immersion in their clean waters.

Here I focus only on the following points: *total ban on fishing, feeding to localize and protect fish and the pros and cons of the catch-and-release programme*. It may be difficult to ban fishing in Ramnagar Forest Division as a large number of families are involved in fishing throughout Uttarakhand. Fishermen in Ramnagar may protest if they alone are asked to give up fishing. Existing information indicates that in spite of their occasional clandestine fishing, the population of fish in the Kosi River is steady. What is needed is regular monitoring and protection from unethical means of fishing, such as dynamiting. Fishermen should be motivated to not lose this valuable resource. There is no need to establish a hatchery for mahseer anywhere in Uttarakhand as the fish population can bounce back within two to three years if protection is good when they spawn. A female mahseer can lay 6000-10,000 eggs per kg body weight and at the age of two to three years, the fish can start breeding. Interestingly Jim Corbett in *Jungle Lore* writes about one evening's splendid fishing in the Kosi River when he was in Mohand arranging a tiger shoot for the Maharajah of Jind.

Limited feeding of mahseer by devotees in places of worship on the banks of the rivers (Haridwar and Rishikesh are good examples) have been taking place for a long time now. Besides the mahseer feed on the remains of partly burnt human bodies that enter the rivers from the burning ghats (see the article attached, A. St. J. Macdonald, A fishing trip in Kumaon, *JBNHS*, 38: 598-600).

While angling was allowed in the Kaveri River till 2012, the fish in the deep pools were baited with ragi balls (*Eleusine coracana*) and this protected the fish from dynamiting. Baiting will not lead to explosion of the fish population, which, in fact, is much under the 'carrying capacity' (a difficult concept to assess in the field, except in ranch lands) as the fish have been killed by people and by predators such as otters and fish eagles.

It is true that catch-and-release angling causes some trauma to the fish, but it is a time-tested conservation tool. With proper tools (hooks without barbs) and humane handling (fish should be given sufficient rest after they are caught, fingers should not be inserted into the gills, and they should be lifted above water only for a minimum period) the strain to the fish can be significantly reduced. Existing information suggests that mortality is negligible if such humane handling practices are followed.

This iconic fish in Mongolia, which has now become extinct in China and is threatened in Russia, owes its survival to the catch-and-release programme. It would be prudent

and ecologically sound not to let the animal welfare cast a shadow over effective conservation strategies. Recovery in the Nandhour River cannot be cited as a model for the whole of

Uttarakhand, as there are no villages on the banks of this river. Along the other mahseer rivers, there are numerous human habitations, and the people in the village, hungry for nutritious food, enter the rivers in the rainy season (spawning season for the mahseer) and use unethical methods to kill the fish. These methods include dynamiting, gill netting in spawning streams, blocking the entire river/stream with traps and using electricity and poison.

In such a situation, only a people-centric programme that will benefit the villagers will help save the fish. Even in Nandhour River, a single raid by the local community known for poaching, using dynamites, could eradicate the results of the protection given over several months. So any extent of protection on paper will not save the fish, but only a programme that provides benefit to the people will save this glorious fish of Uttarakhand.

In mid-July 1996, I witnessed ten men dynamiting the Mandal River, just below Maidavan. An elderly guard and I ran towards them and on spotting us they fled away. Anyone who has observed the abundance of large fish in Ghairal and Highbank in Ramganga for some decades (I first observed both places in November 1983) would agree that the previous levels of abundance no longer exist. Let us remember and honestly agree that most fish that leave the confines of Corbett National Park for spawning along Palain, Mandal and Ramganga do not return as they get killed.

Ms Rawat from Marchula, who was part of the team that managed the two-kilometre stretch of the Ramganga river above Marchula when angling was allowed, along with the late. AS Negi, attended the meeting. I had stayed with the team and seen the programme in Marchula. He showed me the diary he maintained in 2004–05 and there were many records of fish caught and released. But now, he admitted that the river is almost devoid of fish as the villagers continue to decimate them. When I crossed the Ramganga river near Domunda on April 10, 2017, the river had very little water and looked lifeless to me. Sadly, the unwanted development on the banks of the Ramganga river opposite Domunda, built with extravagant financial investment, shows how difficult it is for us to protect the priceless reserve and its denizens.





"An unwanted development on the bank of Ramganga River, just north of Domunda"

We are all aware that such developments are a great threat to all forms of wildlife, particularly to mahseer during the spawning season. However, despite being aware of these problems, we should strive to protect our peerless wildlife with sincerity and dedication, year after year, as conservation is a never-ending sustained engagement between people and Nature.

### **ACKNOWLEDGEMENTS**

*Madhavi Sethupathi and Nandini Murali are thanked for their invaluable help in writing the article.*

### **About The Author**



One of India's leading naturalists and field biologists; carried out a study on dholes (*Cuon alpinus*) in Bandipur Tiger Reserve in the late 1970s (first such a study on free ranging large mammals in India), research at the Smithsonian Institution, USA, and the Bombay Natural History Society (BNHS); retired in 2005 as Dean Faculty of Wildlife Sciences, from Wildlife Institute of India Dehradun after training a generation of wildlife biologists and forest officers.

# INDIGENOUS KNOWLEDGE ON MANGROVES AND THEIR ASSOCIATES FROM MAHANADI DELTA IN THE STATE OF ODISHA

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## Abstract

Mahanadi delta occupies a significant position in the phytogeography of India as it harbours considerable number of mangroves and their associates in the Indian sub-continent. From an extensive survey programme through Integrated Coastal Zone Management Project, Odisha indigenous knowledge on as many as 17 mangrove species and their associates have been gathered. After nomenclatural citation concise phytography and uses of these species have been provided.

**Key words:** Mangroves, Mahanadi delta, indigenous knowledge, Conservation

## Introduction

Mangroves are halophytic, littoral plant formations of tropical, subtropical coastlines and estuaries. Mangrove forests are among the world's most productive tropical ecosystems, lying between land and sea. They are endowed with rich living resources that provide forestry and fishery products to a large human population. The mangroves protect coastal zones from erosion and provide food and shelter for a large number of fishes, birds and wild animals. However, mangrove habitats are under serious threat of destruction, mainly due to human interference. In Odisha, mangroves occur in discontinuous patches along 480 km coastline. Orissa has three important mangrove wetlands at the Mahanadi, Brahmani–Baitarani delta and at the mouth of River Devi.

Mahanadi delta is situated between 19°45' - 20°30' N latitude and 85°15' - 86°50' E longitude in the east coast of India. It occupies an important position as it harbours an important mangal formation in the Indian sub-continent. It has an area of 13600 sq.kms (Nayak *et al.*, 2003). The temperature of this region ranges from 21°C - 40°C. The soil types are sandy in the fringes of the coast and alluvial silty along the mouth of the river Mahanadi.

From the past floristic studies conducted by a number of earlier workers such as Haines (1921-25), Mooney (1950), Rao *et al.* (1970,1982), Choudhury *et al.* (1991,1993), Subudhi *et al.* (1992), Choudhury (1994), it is evident that the flora of this region was much rich and diverse in remote past. In course of time, the vegetation including the mangroves have been depleted at an alarming rate due to the operation of several biotic pressures such as establishment of Paradeep Port, Paradeep Phosphates Limited, Piscicultures, settlement of immigrants etc. However, in recent years the Forest and Environment Department, Government of Odisha has taken benevolent steps to increase mangrove cover in Mahanadi delta through various schemes.

Mangroves cater immediate need to the local inhabitants in many ways. The traditional method of using different parts of mangroves and their associates for various purposes is still practiced. So, it is high time to document the treasure of indigenous knowledge before vanishing. Considering the medicinal potentiality of mangroves, 200 ha patch in Kansaridia PRF under Mahakalapada Wildlife Range has been designated as Medicinal Plants Conservation Area (MPCA) in 2008-09. This area harbours a number of mangroves and their associates with potential medicinal value. Besides mangroves, Mahanadi delta also harbours several plants having medicinal and other socio-economic importance (Nayak and Choudhury, 2001)

Keeping in view the various socio-economic importance of mangrove elements and their associates, intensive floristic survey and documentation of indigenous knowledge through Integrated Coastal Zone Management Project (ICZMP) Odisha has been attempted since 2012.

### **Materials and Methods**

Regular field visits were carried out in different forest blocks in Mahanadi delta during 2012-2015. Information on indigenous knowledge were gathered with due interaction with the local people and were cross checked. The mangroves and their associates were properly identified with the help of local flora (Saxena & Brahmam, 1994-96). As a case study, indigenous knowledge on 17 species of mangroves and their associates have been enumerated alphabetically. In the enumeration the species are arranged alphabetically with bold letters followed by authors' citation, local name in Odia within parentheses and family name in capital letters. Each taxon is provided with short phytography, phenology and local uses have been mentioned at the end.

#### **Enumeration *Acanthus illicifolius* L. (Harakanch) ACANTHACEAE**

Prickly shrub. Leaves sessile, oblong, rigid, secondary nerves running out into spines. Flowers blue in terminal spikes.

Flowering: June-August

Fruiting: September-November

**Uses:** The roots of the plant after proper washing is crushed and the paste is applied on cut surface due to stinging of a local fish (Kaanda). The pain is relieved after few hours.

#### ***Aegialites rotundifolia* Roxb. (Banarua) PLUMBAGINACEAE**

Small tree. Leaves orbicular, apex rounded, base obtuse, nerves parallel; petiole long, fleshy, sheathing below. Flowers white. Hypocotyl with membranous cap.

Flowering: February-March

Fruiting: April-July

**Uses:** The stem is very hard and used for making thatched houses.

#### ***Avicennia officinalis* L. (Bada Bani) AVICENNIACEAE**

Tree; bark grayish-brown. Leaves broadly oblong, shining above. Flowers yellow, in axillary and terminal peduncled, 3-chotomous panicles. Capsule ovoid, wrinkled at the base.



Flowering: June-July

Fruiting: August-September

**Uses:** The log and branches are used as fire wood. The fruits fallen on the ground are eaten by deer. The tender twigs are used as fodder for buffaloes.

***Bruguiera cylindrica* (L.) Bl. (Kaliachua) RHIZOPHORACEAE**

Small tree. Leaves oblanceolate, base cuneate. Flowers white in axillary pedunculate cymes. Fruiting calyx with reflexed lobes. Hypocotyls cylindric, often curved, obscurely ribbed.

Flowering: April-June

Fruiting: July-October

**Uses:** The long cylindrical poles are very hard and used for making thatched house.

***Excoecaria agallocha* L. (Guan) EUPHORBIACEAE**

Dioecious, deciduous small tree with poisonous milky juice and many erect stems. Leaves alternate, ovate-elliptic, acute, coriaceous, old leaves deep red before falling. Male flowers in catkin-like spikes. Female spikes fewer. Capsules depressed-globose, trilocular.

Flowering: May-June

Fruiting: July-August

**Uses:** The matured tree trunk in dried form is cut into small pieces and kept in new earthen pots and slowly supplied with heat. The oil extracted by this process is cooled and externally applied on any type of skin diseases of humans and cattle twice daily till curing.

***Heritiera fomes* Buch-Ham. (Sundari) STERCULIACEAE**

Tall tree with stout pneumatophores; buttress prominent. Leaves narrowly elliptic; petiole rusty pubescent. Flowers pinkish, campanulate. Fruit subglobose, with a longitudinal keel and a distinct transverse circular ridge.

Flowering: February-June

Fruiting: July-September

**Uses:** The pole is used for making agricultural implements and the plank for making outer border of the boats.

***Merope angulata* (Kurz) Swingle (Banalembu) RUTACEAE**

Spiny, evergreen shrub. Leaves simple, elliptic-oblong, thick, coriaceous. Flowers white, fragrant, solitary. Berry ovoid, 3-5 celled, dotted, glabrous.

Flowering: April-May

Fruiting: June-July

**Uses:** The juice extracted from the fruit is taken orally with a dose of 0.5 tea spoon full twice daily for 2-3 days for curing cough and cold of infants.

***Myriostachya wightiana* (Nees ex Steud.) Hook.f. (Naliaghas) POACEAE**

Culms erect, densely tufted. Leaves linear, finely acuminate, smooth. Panicle long, flowering to the base. Spikelets smooth, pedicelled. Glumes unequal; awn stout.

Flowering: June-August

Fruiting: August-October

**Uses:** The tender Culm is used as fodder whereas the matured and dried culm is utilized for thatching purpose. The long stolon arising from the basal region of the culm is used to make different types of baskets.

***Pentatropis capensis*** (L.f.) Bullock (Raigidi) ASCLEPIADACEAE

Slender twiner. Leaves oblong, apiculate. Flowers on slender pedicels. Follicles acuminate; stalk firm.

Flowering: March-June

Fruiting: November-December

**Uses:** The root tied with red thread on right hand believed to cure fever lasting for many days. The fruits are eaten raw.

***Phoenix paludosa*** Roxb. (Hental) ARECACEAE

Soboliferous palm, covered by dark fibrous network of sheath. Leaflets bifarious in one plane. Spadix with numerous spreading branches. Flowers yellowish. Drupe oblong-ovoid, shining black when ripe.

Flowering: March-April

Fruiting: June-August

**Uses:** The straight culm of old and matured plant is very hard and durable which is used for making skeleton of thatched house. The leaves are used for thatching purpose. The matured nut is edible.

***Porteresia coarctata*** (Roxb.) Tateoka (Dhani) POACEAE

Perennial with creeping rhizome on mud flats; culms stout, erect, hard. Leaves unequal sided, rigid, spinulose-serrate. Panicle narrow, few flowered. Spikelets laxly imbricate, deciduous. Fertile lemma boat shaped, with stout hard awn.

Flowering: May-July

Fruiting: August-October

**Uses:** The tender culm is used as fodder and the kernel obtained from the grain is a substitute of rice during lean period.

***Salvadora persica*** L. (Miriga) SALVADORACEAE

Straggling evergreen small tree with drooping branches. Leaves ovate-oblong, fleshy. Flowers greenish-white. Drupe globose, 1-seeded.

Flowering: February-April

Fruiting: May-July

**Uses:** The tender leaves serve as good fodder for deer

***Sonneratia apetala*** Buch.-Ham. (Keruan) SONNERATIACEAE

Tree; bark dark-grey and rough below on old trees. Leaves narrow-elliptic, often oblique. Flowers both lateral and terminal. Petals 0. Style long; stigma mushroom shaped. Fruit broader than long.

Flowering: May-June

Fruiting: July-August

**Uses:** The leaves are crushed and tied with cloth on knee or foot for curing knee or foot swelling. The unripe fruit pericarp is used occasionally for preparing a local dish known as "Tak".

***Sonneratia caseolaris* (L.) Engl. (Orua) SONNERATIACEAE**

Small tree; bark white. Leaves broadly obovate, apex rounded. Flowers over 5 cm across. Calyx flat, expanded under ripe fruit. Petals 6, linear, red. Stigma capitate. Fruit globose, broader than long.

Flowering: April-June

Fruiting: July-September

**Uses:** The fleshy pericarp of raw fruit is used for making pickle.

***Suaeda maritima* (L.) Dumort (Giria) CHENOPODIACEAE**

Branched herb; branches spreading from the base. Leaves fleshy, linear, more or less tinged with purple. Flowers numerous in clusters, running out into terminal spikes. Perianth green. Seeds horizontal, shining brown.

Flowering & Fruiting: April-December

**Uses:** The tender leaves are used as leafy vegetable.

***Thespesia populnea* (L.) Sol. Ex Corr. (Habali) MALVACEAE**

Small tree. Leaves orbicular-ovate, cordate, 7-nerved at base. Flowers solitary, axillary. Calyx campanulate. Corolla yellow with dark purple centre. Capsule globose, indehiscent, 4-5 loculed. Seeds 4 per locule, obovoid, densely hairy.

Flowering: June-August

Fruiting: September-December

**Uses:** The juice extracted from raw fruits is taken orally with a dose of one tea spoon full thrice daily for 2-3 days for curing cough and cold of adult human beings.

***Xylocarpus granatum* Koenig (Sisumar) MELIACEAE**

Small tree. Leaflets 1-2 pairs obovate-oblong, apex rounded. Flowers yellowish, in panicles. Capsules large, woody, globose. Seeds large, many per capsule, viviparous.

Flowering: April-September

Fruiting: October-May

**Uses:** The kernel is made to paste and applied on breast twice daily for 2-3 days for curing against breast ache and breast swelling.



## **Acknowledgements**

The authors are deeply indebted to the Principal CCF (Wildlife) & Chief Wildlife Warden, Odisha for the facilities of work and constant support. The first author is thankful to the Divisional Forest Officer, Mangrove Forest Division (Wildlife) Rajnagar for rendering necessary facilities and encouragement to carry out the research work. The financial support extended by the authorities of ICZMP Odisha is duly acknowledged.

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## CONCEPT OF BIODIVERSITY

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### INTRODUCTION:

The concept of Biodiversity was first appeared in 1980. It is, infact, the shortened form of two words-‘biological and diversity’. It was coined by W.G. Rosen in 1985. The concept of Biodiversity was first presented by famous entomologist Dr E.O.Wilson in 1986 berofe the American forum for Biodiversity.

### DEFINITION:

Biodiversity (GK, bios=life, ,diversity=forms) or biological diversity can be defined as the vast array of species of micro-organism, algae, fungi, plants and animals occurring on earth either in the terrestrial or aquatic habitat and the ecological complexes of which they are a part.

Biodiversity differ from place to place. It is so because environment conditions of the area as well as the range of tolerance of species determine whether or not a particular species can occur in that area.

### LEVELS OF BIODIVERSITY:

Biodiversity on earth is in different levels of organization as described.

#### 1. GENETIC DIVERSITY :-

Every living organisms stores vast amount of genetic information for instance, bacteriophage has approximately 100 genes, cytoplasm 450-700 genes, E.Coli 3200 genes. Drosophila melanogaster 13000 genes etc.

Genetic diversity is related to variation of genes within species. The variation may be in different variants of same gene, in entire genes or in chromosomal structure. On account of genetic differences all details of body structure giving rise to multitude of intraspecific categories such as sub-species, varieties, races, strain, etc. All these show mangoes, wheat, rice etc.

Environment also plays an important role in impacting diversity of living organisms. genetic changes due to emulations or alternations in the frequency of genes are resulted in altered genotypes. Natural selection favours the survival of those genotypes which are best suited to prevailing environment. This result in formation of polymorphs, (different looking individuals of same species) in sympatric (spatially continuous) population leaves in allopatric (distantly places) population and sub- species in the geographically isolated population. Thus, genetic diversity provide raw materials for adaptation to changing environment and for the evolution of new life forms.

## **2. SPECIES DIVERSITY :-**

It is related to variety in the number and richness of species with in a region and is measured at level of 'species' for eg. Big cats-tigers, lions, snow-leopard belongs to same genus of Panther but they all differ at the species level. Species richness refers to the number of species per unit area. As the area of site increases, the number of species also increases due to more availability of natural resources. However, number of individuals of different species may vary resulting in differences in richness or equitability. Species evenness is the relative abundance with which each species is represented in an area. Species diversity is the product of species evenness.

## **3. ECOSYSTEM DIVERSITY :-**

It is related to different types of ecosystem/habitat; eg. terrestrial (forest, grassland, desert etc.) and aquatic (freshwater and marine) ecosystem. Freshwater ecosystem include lentic (pond, lake), lotic (streams, river) and wetland (swamps, bogs) whereas marine ecosystem include open oceans, upwelling regions and coastal ecosystem (estuaries, coral reefs, etc.). Ecosystem diversity explains diverse no. of niches, trophic levels and various ecological processes that sustain energy flow, foodwebs and recycling of nutrient within the geographical area, there may be variable number of ecosystem habitat. The number of ecosystem or habitat present in a region is also a measure of biodiversity.

## **FACTORS INFLUENCING BIODIVERSITY :**

Biodiversity is influenced by several factors:-

- 1) Human activity
- 2) Number of species
- 3) Number of specimen
- 4) Climate
- 5) Weather
- 6) Natural Disaster

## **About The Authors**

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## PROTECTION OF AMUR FALCONS, A MIGRATORY BIRD, IN THE STATE OF NAGALAND- A SUCCESS STORY

**Shri Satya Prakash Tripathi**

**Chief Wildlife Warden, Nagaland, Dimapur**

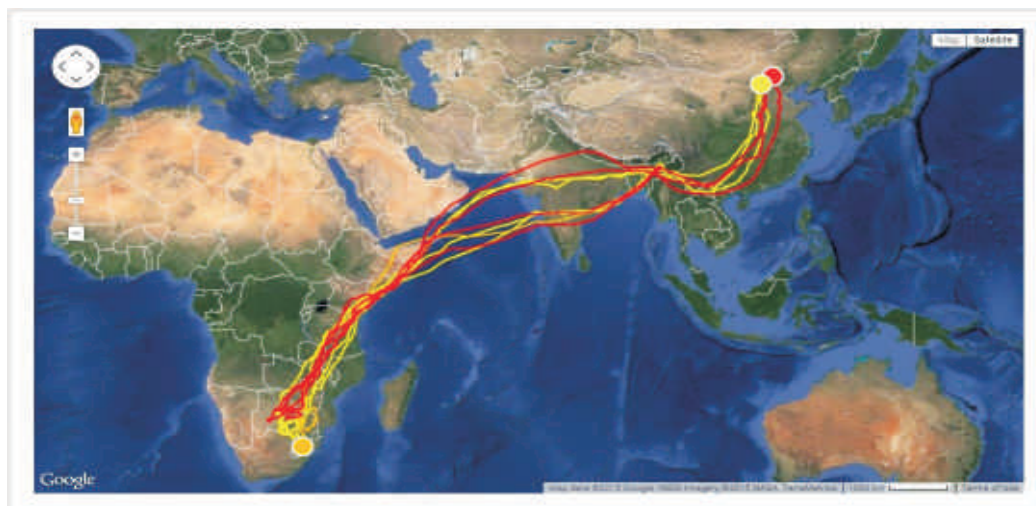
The Amur Falcon (*Falco amurensis*), formerly Eastern Red-footed Falcon, is a small raptor of the falcon family. It breeds in south-eastern Siberia and Northern China, wintering in Southern Africa. Its diet consists mainly of insects, such as termites.



**Fig: Amur Falcon**

Males are characteristically dark grey with a chestnut lower belly and thighs, and a white under wing, visible in flight. Females have a typical falcon head pattern and has cream or orange under parts, with dark streaks and bars, grey upperparts with a slaty-coloured head and cream forehead, and bars and spots on the wings and tail, which have broad, dark tips. The juvenile resembles the female, but may be paler, with reddish-brown or buff edges to the feathers

Around October-November, winter sets in over the Northern hemisphere and temperature falls below freezing point. Survival becomes a concern for non-hibernating birds like the Amur falcons and, hence, they adopt a different but arduous strategy for survival. They undertake an epic marathon migration covering a long distance of around 22000 km during their onward and backward elliptical journey. It is one of the longest distances covered by any bird. They migrate to the southern African countries where life is much more comfortable in a warmer and an insect abundant savannah.



**Fig: Migration route of Amur Falcon**

The people of the State had been hunters since time immemorial . The killing of birds was with purpose self consumption, community festivity, hobby and also economic earning for livelihood.

In 2012, a Bangalore-based NGO, Conservation India, came out with a report of mass killing of the Amur falcons in the Doyang catchment area, mostly in Pangti village. This report was acknowledged by reputed print and electronic media at the national and international levels. It served to draw the attention of the Central and State Governments and conservationists all across the continent but owing to the socio-economic circumstances of the region, it received a mixed response. It, however, succeeded in accelerating the conservation movement in Nagaland.

The Nagaland Forest Department took protection of Amur falcons as a challenge. The confidence of the Government was taken. The Honourable Chief Minister, Nagaland was approached by the Forest Department for his support in the endeavour of protection of Amur falcons. The Honourable Chief Minister, Nagaland, on the eve of celebration the World Environment Day 2013 at Kohima, declared Amur Falcon as the State Guest. In the State of Nagaland, ownership of forests is completely different as compared to the other parts of the country. In other parts the ownership of the lion's share of the forest wealth is under the control of the Government and a little share of forest wealth is control of individuals and communities. In Nagaland, the lion's share (88.3%) of forest wealth is under the control of individuals and communities; where the Government have a little regulatory role.

The role of individuals and communities becomes paramount. Each and every stakeholder was mobilised . Villagers, school/ colleges, district administration/ police, army and paramilitary personnel were involved in protection of the birds. The Society took a decision not to kill the birds. The Government Notified to stop development fund of a village involved in killing of wild animals including Amur falcons. This acted as a deterrent measure for killing Amur falcons. This is a unique Notification of the country.

Awareness campaigns, prayer campaign, marathon run were organised. District Level of Co-ordination committee was constituted for protection of Amur falcons. Nagaland Armed Forest Protection Force was deployed at Doyang Hydro Project reservoir, where a lot of killing was reported in 2012, and other vulnerable locations.



**Fig: Special sermon and Signature Campaign**





**Fig: Awareness in eco-clubs**



**Fig: Run Like Marathon Migrant**

### **Livelihood.**

Village Council members signed a tripartite Memorandum of Understanding (MoU) with the Wildlife Trust of India (WTI) and Natural Nagas to stop wide-scale hunting of Amur falcons in the Doyang Reservoir. Following the MoU, under Rapid Action Programme, 'Bird for Bird' programme was implemented to address the meat requirement and another programme called 'Grain for Grain' to compensate the losses incurred due to wild elephants. Also, a protection squad was formed involving the villagers. According to them, a plan to give economic incentives to the landowners of the roosting sites was conceived.

To address the grievances of the people a plan in collaboration with Nagaland Livelihood Mission, Tourism, Fisheries, etc. was made and trust was strengthened between the community and the Department. The fishermen who hunt the birds during the lean season of fishing were pacified and this resulted in them constructively cooperating to give safe passage to the birds.





**PHOTO ALBUM**



**Crested Kingfisher**

**Mansoor Mazhar Rizvi**



**Purple Sunbird**

**Eric Thomas**

**PHOTO ALBUM**



**Pied Bush Chat**

**Vishnu Sharan Rastogi**



**Red billed Leiothrix**

**Vishnu Sharan Rastogi**



**PHOTO ALBUM**



**Long Tailed Minivet (male)**

**Vishnu Sharan Rastogi**



**Himalayan Blue Tail**

**Vishnu Sharan Rastogi**



**PHOTO ALBUM**



**Yellow footed Pigeon**

**Zaheer Bakshi**



**Brown Fishing Owl**

**Maxim Thomas**

## Outcome

The result of all the aforementioned efforts put in by everyone concerned was that the fishermen who were once hunters enthusiastically participated in a joint mission of satellite tagging few individuals of the Amur Falcon. This was an initiative of the Wildlife Institute of India (WII) Dehradun, Raptors MoU of the Convention on Migratory Species (CMS), MME (Birdlife International) Hungary and the Department of Forest, Ecology, Environment and Wildlife Nagaland. 28 birds were ringed altogether with the rings made available by the Bombay Natural History Society (BNHS). From among these, 3 individuals were selected and PTT tagged-one male named **"Naga"** and two females named **"Wokha"** and **"Pangti"** after the State, District and Village respectively. These birds were all tagged and released on 7th November, 2013. The male Amur "Naga" reached South Africa first on 9th January, 2014, while the two females took their own time and reached later on. Then sometime in March, "Naga" and "Pangti" went back to their breeding place in Inner Mongolia while there was no more signal from "Wokha" after reaching South Africa. Since then, the Amur falcons have begun their great migration again and while many have already reached Nagaland, "Naga" and "Pangti" are still awaited with bated breath because the locals now have an emotional connection with these birds



**Fig: Release of satellite tagged birds**

The Amur falcons were well protected and were given safe passage during 2014, 2015, 2016 migratory season. With getting protection every year, their number of Amur falcons significantly increased in the subsequent years. 5 (five) satellite tagged birds had been re-leased from different locations in Nagaland in October-November 2016 to study their migration, food habits etc.

(Satya Prakash Tripathi)  
Chief Wildlife Warden  
Nagaland, Dimapur



## WOODPECKERS

Shri Abhai Mishra

DEAL Colony, Raipur Road, Dehradun

Woodpeckers belong to the Picidae (near-passerines) family in the order Piciformes of class- Aves. They have been divided into three sub-families, viz. Jyninae (wrynecks), Picumninae (piculets) and Picinae (true woodpeckers). Woodpeckers has global presence barring Antarctica, Australia-Oceania, Arctic, Greenland and Madagascar. The richest presence of the woodpeckers is in South America followed by South-East Asia. The woodpeckers are mainly sedentary but few does seasonal migrations including Eurasian Wryneck, which winters in India.

They can excavate cavities on hard surfaces due to variety of anatomical adaptations. The head of the woodpecker experiences 1200 G deceleration while drumming with a speed of 22 times per second. Professional pilots under extreme training reach up to a maximum of 10 G. Between their upper mandible and skull, the curved maxilla which is a sort of spongy tissue acts as a shock absorber thus reducing the direct pressure on the brain. Other than this, there are number of anatomical adaptations to suit their lifestyle like, long barbed tongue, hard & flexible bill and rigid rachis.

Barring a few exception, woodpeckers, piculets and wrynecks has feet having four toes with the first and fourth facing backwards while other two facing inwards. With this special arrangement they can climb the tree trunk vertically for foraging and nest excavation. They are basically arboreal in nature and prefer wooded habitats. Some of the species has adapted feeding on the ground while a very few has abandoned the trees entirely and nests in the ground, such as Ground Woodpecker found in South Africa. Two of the American species, ivory-billed woodpecker and imperial woodpecker are considered to be extinct since the mid of late twentieth century.

Ecologically, woodpeckers help to keep trees healthy by keeping them from suffering mass infestations. The family is noted for its ability to acquire wood-boring grubs from the trunks and branches, whether the timber is alive or dead. The cavity they create plays an important role for the survival of other organisms. The bar-breasted piculet is the smallest while the great slaty woodpecker is considered to be the largest woodpecker. Around seventeen species are found in the sub-Himalayan Sal forests of northwest India. For their survival and growth large-sized tress play an important role. Some of the woodpeckers are very colourful possessing white, red, black, brown, and green colour plumage.

Shri Abhai Mishra



Abhai Mishra he is a scientist with Defence Research and Development Organisation. He is a keen wildlife photographer and life member of WPS. As a philatelist he specializes in the area of Indian Antarctica, Uttarakhand and WW-2 POW camps in India. Besides writing scores of philatelic articles in leading newspaper and journals he has authored two books namely "Uttarakhand – A philatelic Journey" published by Department of Posts and "Indian Antarctic Expedition – Philatelist's Guide". He has been to Antarctica with twenty-first Indian Expedition as communication officer. He is also a heritage enthusiast and conducts heritage walks for "Been There, Doon That?" to spread heritage awareness among the citizen of Doon valley. Other than that he is also an avid birdwatcher and loves walking.



## REVISED INVENTORY ON THE BUTTERFLIES (INSECTA LEPIDOPTERA: PAPILIONOIDEA) OF PUNJAB, INDIA

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### ABSTRACT

: A study on the butterfly diversity of Punjab, India was conducted from 2011 to 2014. A total of 88 species belonging to 61 genera under five families were compiled. Three species *i.e.*, *Libythea myrrha sanguinalis* Fruhstorfer, *Elymnias hypermnestra undularis* Drury and *Euploea mulciber mulciber* (Cramer) were added to the butterfly fauna of Punjab for the first time. Species richness was greatest for the family Nymphalidae with 34 species, followed by Lycaenidae with 25 species, Pieridae with 21 species, Papilionidae and Hesperidae with 4 species each. An analysis of relative abundances revealed that of the 88 species reported, 36 were classed as common, 17 as less common and the remaining 35 species as uncommon.

**Keywords:** Butterfly, species diversity, inventory, Punjab.

### INTRODUCTION

Punjab state of India is located in northwestern India between latitude 29°33' and 32°32' N and longitude 73°53' and 76°56' E. It is bounded by the Indian states of Jammu & Kashmir to the north, Himachal Pradesh to the northeast, Haryana to the south and south-east and Rajasthan to the southwest and on the west by Pakistan. Punjab, an intensively cultivated state having more than 84% area under agriculture. The recorded forest area of the State is 3,058 km<sup>2</sup> which is only 6.07% of the State's geographical area. Reserved Forest constitutes 1.44%. Protected Forests 37.70% and the Unclassed Forests 60.86% of the total forest area.

There are 17280 species of butterflies known from the world, out of which 1641 species occur in India which is about 9.5% of the total species of butterflies in the world. The butterfly fauna of India is well studied in the past. The work of de Niceville (1886, 1890), Moore (1890-1905), Marshall & de Niceville (1883), Swinhoe (1893, 1896, 1905-1913),

Bingham (1905, 1907), Evans (1932), Talbot (1939, 1947), Wynter-Blyth (1957), and Kehimkar (2008) are some of the significant publications on Indian butterflies.

Recently, much information on butterflies of different regions, states and protected areas of India has been published (e.g. Gupta & Shukla 1987 (Madhya Pradesh); Mondal & Maulik 1991 (Orissa); Haribal 1992 (Sikkim); Mondal & Maulik 1997 (West Bengal); Mondal *et al.* 1997 (Delhi); Mondal & Maulik 1998 (Meghalaya); Kunte 2000 (Peninsular India); Maulik 2003 (Sikkim); Mondal & Maulik 2004 (Manipur); Ambrose & Raj 2005 (Kalakad-Mundanthurai Tiger Reserve, Tamil Nadu); Maulik 2007 (Andhra Pradesh); Chandra *et al.* 2007 (Madhya Pradesh and Chattishgarh); Kumar 2008 (Uttarakhand); Arora *et al.* 2009 (Himachal Pradesh); Sharma 2012 (Maharashtra); Kunte *et al.* 2012 (Garo Hills, Meghalaya); Palot *et al.* 2012 (Kerala) and Aneesh *et al.* 2013 (Kerala)). However, butterfly diversity at the regional level remains data deficient in most of the regions and states of India.

The state of Punjab is still unexplored in terms of butterfly diversity and is mainly restricted to Rose and Sidhu (2001) who provided an inventory of 74 species of butterflies from Punjab; Arora *et al.* (2006) gave a brief account of 74 species from Punjab Shivaliks; and Sharma and Joshi (2009) listed 41 species from Dholbaha dam (Hoshiarpur).

## **METHODOLOGY**

Collections and observations were made in all the 22 districts of Punjab during the different seasons of the year (2011 to 2014). Butterflies were collected with a butterfly net and voucher specimens (non-schedule species of Wildlife (Protection) Act 1972) preserved for identification. These have been deposited in the National Zoological Collection (NZC) at the Northern Regional Centre, Dehradun.

The works of Evans (1932), Talbot (1939, 1947), Wynter-Blyth (1957), Haribal (1998) and Kehimkar (2008) were used to identify specimens to species and subspecies. Digital photographs were taken in the field of as many species as possible with aid of Digital Camera (DX-80 model of Nikon make). Latitude, Longitude and Altitude were recorded with the aid of GPS of Garmin make (model OREGON® 550).

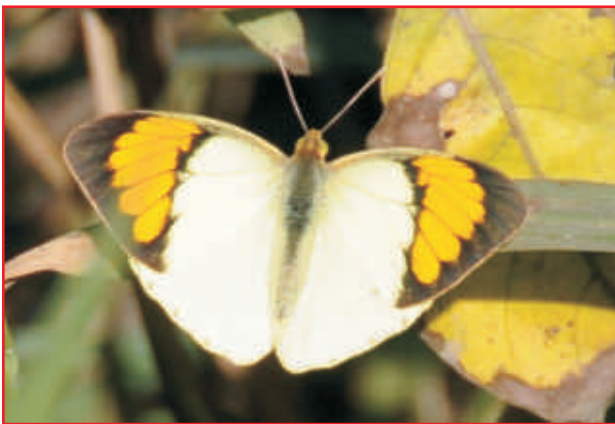
The abundance status provided here is based on an arbitrary frequency scale formulated from the present observations based on the numbers obtained and was quantified as follows: Common (encountered 6-10 times), Less Common (3-5 times), and Uncommon (only once or twice).



*Papilio demoleus* Linnaeus, 1758



*Phalanta phalantha* (Drury, 1770)



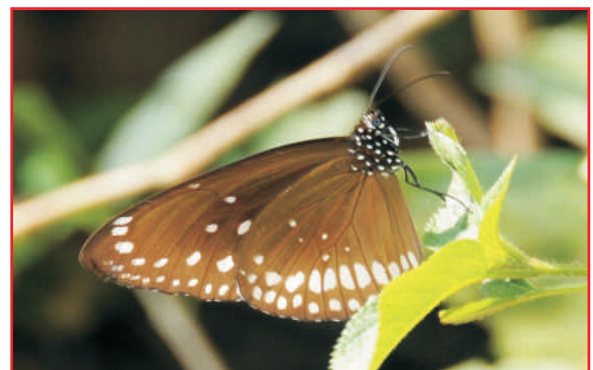
*Ixias pyrene*(Linnaeus, 1764)



*Delias eucharis*(Drury, 1773)



*Elymnias hypermnestra undularis* Drury, 1773



*Euploea core*(Cramer, 1780)



## RESULTS

The systematic list (Table 1) deals with of 88 species belonging to 61 genera under five families. Three species *i.e.*, *Libythea myrrha sanguinalis* Fruhstorfer, *Elymnias hypermnestra undularis* Drury and *Euploea mulciber mulciber* (Cramer) were added to the butterfly fauna of Punjab for the first time. Species richness was greatest for the family Nymphalidae with 34 species, followed by Lycaenidae with 25 species, Pieridae with 21 species, Papilionidae and Hesperidae with 4 species each. An analysis of relative abundances revealed that of the 88 species reported, 36 were classed as common, 17 as less common and the remaining 35 species as uncommon

**Table 1 : Systematic List of Butterfly species of Punjab, India**

|    | Species                                         | Common name             | Status      |
|----|-------------------------------------------------|-------------------------|-------------|
|    | Family PAPILIONIDAE                             |                         |             |
|    | Subfamily PAPILIONINAE                          |                         |             |
| 1  | <i>Graphium sarpedon luctatus</i> (Fruhstorfer) | The Common Blue Bottle  | Uncommon    |
| 2  | <i>Papilio polytes romulus</i> Cramer           | The Common Mormon       | Common      |
| 3  | <i>Papilio demoleus demoleus</i> Linnaeus       | The Lime Butterfly      | Less Common |
| 4  | <i>Chilasa clytia clytia</i> (Linnaeus)         | The Common Mime         | Uncommon    |
|    | Family PIERIDAE                                 |                         |             |
|    | Subfamily PIERINAE                              |                         |             |
| 5  | <i>Delias eucharis</i> (Drury)                  | The Common Jezebel      | Uncommon    |
| 6  | <i>Leptosia nina nina</i> (Fabricius)           | The Psyche              | Less Common |
| 7  | <i>Anapheis aurota aurota</i> (Fabricius)       | The Pioneer             | Common      |
| 8  | <i>Pieris canidia indica</i> Evans              | Indian cabbage White    | Common      |
| 9  | <i>Pieris brassicae nepalensis</i> Linnaeus     | The Large Cabbage White | Common      |
| 10 | <i>Pieris napi ajaka</i> Moore                  | The Green Veined White  | Uncommon    |
| 11 | <i>Pieris rapae</i> (Linnaeus)                  | The Small Cabbage White | Uncommon    |
| 12 | <i>Cepora nerissa phryne</i> (Fabricius)        | The Common Gull         | Common      |
| 13 | <i>Pontia daplidice moorei</i> (Rober)          | The Bath White          | Common      |
| 14 | <i>Ixias marianne</i> (Crammer)                 | The White Orange Tip    | Common      |
| 15 | <i>Ixias pyrene kausala</i> Moore               | The Yellow Orange Tip   | Common      |
| 16 | <i>Colotis amata</i> (Fabricius)                | The Small Salmon Arab   | Uncommon    |
| 17 | <i>Colotis vestalis</i> (Butler)                | The White Arab          | Uncommon    |
|    | Subfamily: COLIADINAE                           |                         |             |
| 18 | <i>Catopsilia crocale crocale</i> (Cramer)      | The Common Emigrant     | Common      |

|    | <b>Species</b>                                        | <b>Common name</b>               | <b>Status</b> |
|----|-------------------------------------------------------|----------------------------------|---------------|
| 19 | <i>Catopsilia pyranthe pyranthe</i><br>(Linnaeus)     | The Mottled Emigrant             | Common        |
| 20 | <i>Catopsilia florella gnoma</i><br>(Fabricius)       | The African Emigrant             | Common        |
| 21 | <i>Colias electo fieldi</i> Me-<br>netries            | The Dark Clouded Yellow          | Less Common   |
| 22 | <i>Colias erate erate</i><br>(Esper)                  | The Pale Clouded Yellow          | Uncommon      |
| 23 | <i>Eurema hecabe fimbriata</i><br>(Wallace)           | The Common Grass Yel-<br>low     | Common        |
| 24 | <i>Eurema brigitta rubella</i><br>(Wallace)           | The Small Grass Yellow           | Uncommon      |
| 25 | <i>Eurema blanda</i><br><i>silhetana</i> (Wallace)    | The Three Spot Grass Yel-<br>low | Uncommon      |
|    | Family Nymphalidae<br>Subfamily NYMPHALINAE           |                                  |               |
| 26 | <i>Ariadne merione tapes-<br/>trina</i> (Moore)       | The Common Castor                | Common        |
| 27 | <i>Argyreus hyperbius hy-<br/>perbius</i> (Linnaeus)  | The Indian Fritillary            | Uncommon      |
| 28 | <i>Hypolimnas misippus</i><br>(Linnaeus)              | The Danaid Eggfly                | Less common   |
| 29 | <i>Hypolimnas bolina</i><br>(Linnaeus)                | The Great Eggfly                 | Less Common   |
| 30 | <i>Cyrestis thyodamas ga-<br/>nescha</i> Boisduval    | The Common Map Butter-<br>fly    | Uncommon      |
| 31 | <i>Phalanta phalantha</i><br><i>phalantha</i> (Drury) | The Common Leopard               | Common        |
| 32 | <i>Cynthia cardui</i><br>(Linnaeus)                   | The Painted Lady                 | Uncommon      |
| 33 | <i>Symbrenthia hippoclus khasi-<br/>ana</i> Moore     | The Common Jester                | Uncommon      |

|    | Species                                          | Common name                            | Status      |
|----|--------------------------------------------------|----------------------------------------|-------------|
| 34 | <i>Junonia iphita</i> (Cramer)                   | The Chocolate Pansy                    | Common      |
| 35 | <i>Junonia hierta hierta</i> (Fabricius)         | The Yellow Pansy                       | Less Common |
| 36 | <i>Junonia atlites</i> (Linnaeus)                | The Grey Pansy                         | Common      |
| 37 | <i>Junonia orithya swinhoei</i> Butler           | The Blue Pansy                         | Common      |
| 38 | <i>Junonia lemonias persicaria</i> (Fruhstorfer) | The Lemon Pansy                        | Less Common |
| 39 | <i>Junonia almana almana</i> (Linnaeus)          | The Peacock Pansy                      | Common      |
| 40 | <i>Kallima inachus hügeli</i> (Kollar)           | <i>Kallima inachus hügeli</i> (Kollar) | Uncommon    |
| 41 | <i>Vanessa indica indica</i> (Herbst)            | The Indian Red Admiral                 | Uncommon    |
| 42 | <i>Neptis hylas astola</i> Moore                 | The Common Sailer                      | Common      |
| 43 | <i>Neptis yerburyi yerburyi</i> Butler           | The Yerbury's Sailer                   | Common      |
| 44 | <i>Athyma perius</i> (Linnaeus)                  | The Common Sergeant                    | Common      |
| 45 | <i>Euthalia aconthea</i> (Cramer)                | The Common Baron                       | Uncommon    |
|    | Subfamily DANAINAE                               |                                        |             |
| 46 | <i>Danaus chrysippus chrysippus</i> (Linnaeus)   | The Plain Tiger                        | Common      |
| 47 | <i>Danaus genutia genutia</i> (Cramer)           | The Common Tiger                       | Common      |
| 48 | <i>Euploea core core</i> (Cramer)                | The Common Indian Crow                 | Common      |
| 49 | <i>Euploea mulciber mulciber</i> (Cramer)        | The Striped Blue Crow                  | Uncommon    |
| 50 | <i>Tirumala limniace leopardus</i> (Butler)      | The Blue Tiger                         | Uncommon    |
| 51 | <i>Prantica aglea melanoides</i> Moore           | The Glassy Tiger                       | Uncommon    |
|    | Subfamily SATYRINAE                              |                                        |             |
| 52 | <i>Mycalesis mineus mineus</i> (Linnaeus)        | The Dark-Brand Bushbrown               | Common      |
| 53 | <i>Lethe rohria rohria</i> (Fabricius)           | The Common Tree-brown                  | Less Common |



|    | Species                                        | Common name                | Status      |
|----|------------------------------------------------|----------------------------|-------------|
| 53 | <i>Lethe rohria rohria</i> (Fabricius)         | The Common Tree-brown      | Less Common |
| 54 | <i>Elymnias hypermnestra undularis</i> (Drury) | The Common Palmfly         | Less Common |
| 55 | <i>Ypthima hübneri</i> Kirby                   | The Common Fourring        | Less Common |
| 56 | <i>Ypthima inica</i> Hewitson                  | The Lesser Threering       | Less Common |
| 57 | <i>Melanitis leda ismene</i> (Cramer)          | The Common Evening Brown   | Common      |
|    | Subfamily ACRAEINAE                            |                            |             |
| 58 | <i>Acraea violae</i> (Fabricius)               | The Tawny Coster           | Less Common |
|    | Subfamily Libytheinae                          |                            |             |
| 59 | <i>Libythea myrrha sanguinalis</i> Fruhstorfer | The Club Beak              | Uncommon    |
|    | Family LYCAENIDAE<br>Subfamily THECLINAE       |                            |             |
| 60 | <i>Horaga albimaculata viola</i> (Moore)       | The Brown Onyx             | Uncommon    |
| 61 | <i>Horaga onyx</i> (Moore)                     | The Common Onyx            | Uncommon    |
| 62 | <i>Spindasis vulcanus vulcanus</i> (Fabricius) | The Common Silver-line     | Uncommon    |
| 63 | <i>Spindasis ictis ictis</i> (Hewitson)        | The Common Shot Silverline | Uncommon    |
| 64 | <i>Spindasis elima elima</i> (Moore)           | The Scarce Shot Silverline | Uncommon    |
| 65 | <i>Rapala iarbus sorya</i> (Kollar)            | The Indian Red Flash       | Uncommon    |
| 66 | <i>Pratapa deva</i> (Moore)                    | The Tufted White Royal     | Uncommon    |
|    | Subfamily POLYOMMATINAE                        |                            |             |
| 67 | <i>Tarucus hazara</i> Evans                    | The Himalayan Pierrot      | Uncommon    |
| 68 | <i>Tarucus alteratus</i> Moore                 | The Rusty Pierrot          | Less Common |
| 69 | <i>Tarucus balkanica nigra</i> (Bethune-Baker) | The Black Spotted Pierrot  | Uncommon    |
| 70 | <i>Tarucus indica</i> Evans                    | The Pointed Pierrot        | Uncommon    |
| 71 | <i>Castalius rosimon</i> (Fabricius)           | The Common Pierrot         | Common      |
| 72 | <i>Leptotes plinius</i> (Fabricius)            | The Zebra Blue             | Less Common |
| 73 | <i>Azanus ubaldus</i> (Cramer)                 | The Bright Babul Blue      | Uncommon    |
| 74 | <i>Lampides boeticus</i> (Linnaeus)            | The Pea Blue               | Common      |

|    | Species                                     | Common name           | Status      |
|----|---------------------------------------------|-----------------------|-------------|
| 75 | <i>Prosotas nora ardates</i> (Moore)        | The Common Line       | Common      |
| 76 | <i>Catochrysops strabo</i> (Fabricius)      | The Forget-me-not     | Common      |
| 77 | <i>Euchrysops cnejus cnejus</i> (Fabricius) | The Gram Blue         | Common      |
| 78 | <i>Everes lacturnus assamica</i> Tytler     | The Indian Cupid      | Uncommon    |
| 79 | <i>Freyeria putli</i> (Kollar)              | The Grass Jewel       | Common      |
| 80 | <i>Chilades laius laius</i> (Crammer)       | The Lime Blue         | Uncommon    |
| 81 | <i>Zizula hylax</i> (Fabricius)             | Tiny Grass Blue       | Less Common |
| 82 | <i>Zizina otis</i> (Fabricius)              | Lesser Grass Blue     | Common      |
| 83 | <i>Pseudozizeeria maha</i> (Kollar)         | The Pale grass blue   | Common      |
| 84 | <i>Zizeeria karsandra</i> (Moore)           | The Dark Grass Blue   | Common      |
|    | Family: HESPERIIDAE                         |                       |             |
|    | Subfamily HESPERIINAE                       |                       |             |
| 85 | <i>Pelopidas mathias</i> (Fabricius)        | The Small Branded     | Common      |
| 86 | <i>Potanthus pallida</i> (Evans)            | The Common Dart       | Less Common |
| 87 | <i>Coladenia dan</i> (Fabricius)            | The Fulvous Pied Flat | Uncommon    |
|    | Subfamily PYRGINAE                          |                       |             |
| 88 | <i>Spialia galba</i> (Fabricius)            | The Indian Skipper    | Less Common |

### **ACKNOWLEDGEMENT**

The Author is thankful to Dr. Kailash Chandra, Director, Zoological survey of India, Kolkata for encouragement throughout. Thanks are also due the Chief Wildlife Warden, Punjab for necessary permission to undertake the General Faunistic Survey work and for various courtesies.

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## BEWARE! MAN IS ON THE PROWL

**Ms Rohini Puri**

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*“ There is no religion without love, and people may talk as much as they like about their religion, but if it does not teach them to be good and kind to man and beast, it is all a sham...”*

*--- Black Beauty, written by Anna Sewell (1877)*

The author relies on anthropomorphism in the text. It is the attribution of human traits, emotion, and intentions to non-human entities and in this case the horses. The text advocates fairer treatment of horses and the readers gain an insight into how horses suffered through their use by man. This book brought about a kind of role reversal wherein the animals could express their deepest fears and complex emotions in response to the callous attitude of man. It was a benchmark for its time as it gave a voice to animals.

Since time immemorial, we have heard of a bond between man and his chosen animal, be it a dog, a horse or an elephant but rarely do these bonds show equality. It is automatically understood that the animal is the inferior. This bothers me. How can men, who term each other as intolerant, hostile, selfish, not realize what terror we must be for the other beings. Just imagine the terminology used to describe us if the animals had a chance .... “The horror!” ... would be appropriate.

*“ The animals of the world exist for their own reasons. They were not made for humans anymore than black people were made for white or women created for men.”*

*- Alice Walker*

The concept of ownership that a man feels towards an equal being is morally wrong. Many would argue and bring up the point that we are the ‘superior being’. Well, are we? Look around and you will begin to doubt what you have been conditioned to accept. We have termed ourselves as intelligent but for me that is a very narrow term. For no other animal, by our definition is as intelligent, but they survive just fine. Well yes, we have sent space crafts to the moon, Mercury, Venus, Mars, Jupiter and various planetary moons, but maybe it was a good initiative as the ‘superior beings’ are working at a vigorous pace to make their own planet inhabitable. I will not dwell upon the stats which show the poor quality of air that we are breathing or the ridiculously polluted water we give our children to drink daily, because we are way past that. We are immune, not physically alone but intellectually too. There is another good news, we Indians excel in our superiority. This can be seen during festivals as we pollute and create filth in and around our ‘Oh so revered’ rivers! I wonder if the Gods are pleased or are they regretting their decision of adding man to his paradise?!

Moreover, we revere birds and animals in various forms in our customs, but in reality do we actually care about them? It is a well known and now digested fact that various river bodies in and around Dehradun meet the river Suswa which further goes on to meet the Ganga, taking with it offerings from the most intelligent beings some in the form of baskets, glass bottles, cans, plastic bags, cement statues so on and so forth. It gets even worse. Suswa is known to pass through the Rajaji National Park and is believed to contain highly contaminated water. Instances of animal carcasses especially those of elephants, with plastic inside their stomach have been reported. Ironically, we submerge Ganpati – our God with the elephant head. Thus making my point clear that we revere in theory, in reality we the most evolved species is numb to the vast destruction that we are bringing upon our environment.



Being an avid bird watcher and a nature enthusiast, I was deeply saddened to hear of episodes that involved unethical practices in wildlife photography. Man satiates his greed to capture the 'correct' picture using lenses as humongous as missile launchers. He ensures he gets every penny worth of shot from these even if it means hounding a bird while it is making a nest, feeding the hatchlings or mating. It would not be a problem if it is done from a distance and without the uses of call sounds but to glare down upon a nest would invariably make the bird abandon it. Simultaneously, a continuous attempt to follow a herd of deer may land up as a great video on social media and may also raise the person to a sudden moment of fame as he experiences euphoria over the number of likes he gets on the social platform!! But if only the whole truth could be recorded then this 'momentary wildlife lover' would have been rebuked for his ignorant effort in exhausting the deer, stressing it and leaving it tired and vulnerable for an attack. Thus I would request such 'armchair activism' to be recognized and shamed vehemently.

It has for some time been obvious to me that the animals use their sensibility more rationally than us as we lose ours irrationally to brutality. The irony of our role reversal starting from the sensible horses in Black Beauty was witnessed by me on the 16<sup>th</sup> April 2017.

I experience immense peace and tranquility when I am one with nature, be it the way a bud blooms a little every day, the way a droplet of dew stands like a pearl on a leaf, the way the shade of the trees embrace or the way mother nature works in every possible way. It is a mystery to me and I am enchanted by it. So obviously, like a moth to the flame I am beckoned to the wilderness time and again.

This time we were at a steady pace moving quietly along the trail in Rajaji National Park. We were welcomed by a display of sisterly love as few female common rose finches splashed about in a little muddy pool. I was not looking for any 'sighting' as is the norm. Along with my family, we simply drove through the National Park in awe. The trees were worth looking at, each one seemed to have a tale to tell, however, we observed the flickering of life in various forms in and around the bushes, only as mute spectators. A large number of majestic Himalayan Vultures, colorful Indian Rollers, Bee-eaters, Kingfishers, Bush chats and Rose Finches had made me and daughters keep our heads strained in anticipation!! Very soon a number of 'impatient gypsies' overtook us. Within a short while we crossed a herd of spotted deer that were peacefully enjoying their meal. We saw and left. I was slightly pleased as they had been missed by the gypsies who seemed to be on fire!!

Soon we saw that the two vehicles had halted. I expected them to have spotted some deer as they all clambered up with their mobiles. And as I was in bird mode, literally, I could see nothing else in front! As there was no passage for us to move, we had to halt as well only to realize that 90 degrees to our right was a herd of elephants who finally came out of the bushes and were only a few meters away from us. I knew that this was not a favorable situation and waved to the people in front egging them to keep moving. Surprisingly, neither the two gypsy drivers nor the two guides thought it prudent to move forward even with the animals being so close. We were obviously in their space while some buffoons kept waving their cameras to capture every disapproving nod by the female elephant.

Suddenly, I noticed calves behind her and in an instant there was flapping of ears, trumpeting and a sudden charge – a loud and clear message to all of us to flee! But the juvenile behavior by my fellow countrymen was to jump to greater heights! As the female came right at us, we had nowhere to go except backwards and all this while the people who had blocked the path kept their mobiles intact, recording our ordeal .... taking perverse, inhumane pleasure to another level. Do you still want to call man 'enlightened'?

If anyone who showed any intellect at this point, was the elephant. All she wanted was a clear safe passage for her calves and if there was to be an accident it would not have been the animal's fault. Although we are apt at giving terms such as 'man-eaters', 'rogue elephant' yet to me it was clearly the incompetence and chosen ignorance of the gypsy drivers and the guides which instigated the elephant to react in that particular manner. They violated the rules which clearly state that one is to keep adequate distance and to not stop for long. They also did not drive on once the first warning was given. It was not the mighty giants but the camera hugging uncouth men wanting to capture everything without understanding the implications of their actions, which could have caused a disaster.

As the passage cleared, the female led her calves and many more to the other side while the tusker followed at the end. The simple requirement and her restrained show of aggression made me realize how incapable we are in controlling our actions and how complexed, to consider animals to be inferior. We make a grave mistake by considering ourselves to be the Master's complete creation, whereas, in reality we are incomplete. Animals live in full splendor of this planet while we create more chaos, destruction and kill our own kind. If one were to ask me, I would promptly say that, man is the most dangerous of all God's creations. Thus echoing –

“Men ! The only animal in the world to fear. ”

D.H. Lawrence

We have a lot to learn from animals. Their discipline, self-sufficiency, inter-dependence, community living. We can't even live with our own family let alone our neighbours!!

“I think I could live with animals, they are so placid and self contained;  
I stand and look at them long and long.  
They do not sweat and whine about their condition;  
They do not lie in the dark and weep for their sins;  
They do not make me sick discussing their duty to God;  
Not one is dissatisfied-not one is demented with the mania of owning things;  
Not one kneels to another, nor his kind that lived thousands of years ago;  
Not one is responsible or industrious over the whole earth.”

Walt Whitman



#### About the Author

Ms Rohini Puri is the Vice Principal at Little Flower School, . She is an avid birder, a nature enthusiast, an ardent traveller and a writer. She has covered social as well as environmental related issues in her writings. She has also campaigned for the protection of the Tibetan Antelope. Her aim at present is to sensitize this generation towards our precious wildlife.

# माता प्रकृति की अनुपम भेंट-विलक्षण पक्षी जगत

नरेश चन्द्र मधवाल

४३ कालीदास रोड़, देहरादून

पक्षी जगत, भारतीय संस्कृति का अभिन्न अंग है। हमारे अति प्राचीन ग्रन्थों महाभारत, रामायण तथा वेद भी पक्षियों की कहानियों से पूर्ण हैं। भारतवासियों को प्राचीनकाल से ही पक्षियों के बारे में जानकारी प्राप्त थी। संस्कृत में भी पक्षियों के बारे में उपयोगी वर्णन मिलता है।

पक्षियों के जीवन में एक अद्भुत रोमान्च व रहस्य पाया जाता है। सम्पूर्ण पक्षी समुदाय को प्रकृति ने अनूठी विलक्षणता प्रदान की है। एक तरफ तो हमिंग बर्ड है, जो कि आकार में मनुष्य के अंगूठे के बराबर होता है, तो दूसरी तरफ खच्चर के शरीर के बराबर ऊँचा शुतुरमुर्ग भी पाया जाता है। एक ओर आर्कटिक टर्न है जो प्रत्येक वर्ष उत्तरी ध्रुव से दक्षिणी ध्रुव तक आने-जाने की लगभग 35000 कि०मी० की यात्रा सम्पन्न करता है तो इसके विपरीत पेगुइन पक्षी भी है जो एक ईंच तक भी उड़ नहीं सकता है। बया पक्षी हैं जो अपना अत्यन्त कलात्मक व सुन्दर घोंसला बनाते हैं तो टिटहरी जैसे पक्षी भी है जो खुले मैदान में ही अपने अण्डे देते हैं। अत्यन्त मधुर वाणी में गाने वाली कोयल है, तो कौवे जैसी कर्कश बोली वाले पक्षी भी पाये जाते हैं। इस प्रकार समूचे पक्षी समुदाय में हमें विविध प्रकार की अनूठी विलक्षणताएँ दृष्टिगोचर होती हैं।

पक्षी इस पृथ्वी पर प्रागैतिहासिक काल से ही रैन-बसेरा करते आये हैं। विश्वभर में व प्राचीन काल के पक्षी डायनासोरों के जीवाश्म भी प्राप्त हुए हैं। सम्पूर्ण पक्षी-जगत हमारी मानव सभ्यता के लिए अत्यन्त उपयोगी है तथा हमारी पृथ्वी के पर्यावरण के सन्तुलन को बनाये रखने हेतु इनका अपना अलग ही विशिष्ट व महत्वपूर्ण स्थान है। उड़ने के लिए पक्षियों के शरीर की संरचना विशिष्ट प्रकार की होती है। इनके शरीर का आकार नावनुमा होता है, जिससे कि वायु में उड़ते समय न्यूनतम घर्षण व प्रतिरोध उत्पन्न हो व उड़ने में आसानी रहे। पक्षियों के शरीर व डैनों की अस्थियाँ खोखली व वजन में हल्की होती हैं परन्तु इनकी मांसपेशियाँ बहुत सुदृढ़ होती हैं। पक्षियों को उड़ने के लिए बहुत शक्ति व ऊर्जा की आवश्यकता होती है, अतः पक्षी अपना भोजन लगातार ग्रहण करते रहते हैं। अधिकांश पक्षी औसतन अपने भार से पांच गुना अधिक खाद्य-सामग्री का भक्षण करते हैं।

पक्षियों का प्रजनन काल भी नियत व निश्चित समय पर होता है और प्रत्येक प्रजाति के पक्षी के अण्डों की एक निश्चित संख्या होती है। जब तक वह पूरी नहीं हो जाती है, पक्षी अण्डे देना बन्द नहीं करता, बीच में यदि आप पाले हुए कुछ अण्डे हटा दें तो वह पुनः अण्डे देकर निश्चित संख्या पूरी करता है। अण्डों से बच्चों के बाहर निकल आने पर उनके माता-पिता, उनका पालन-पोषण अत्यन्त प्रेम व लगन से करते हैं। सन्तान की रक्षा करने में पक्षी प्रायः अपनी जान की भी बाजी लगा देते हैं।

विश्वभर में पक्षियों की अनुमानत 10000 प्रजातियाँ पायी जाती हैं। भारतवर्ष में पक्षियों की लगभग 1303 प्रजातियाँ पायी जाती हैं, जबकि उत्तराखण्ड में 710 प्रजातियाँ अभी तक देखी गयी हैं। पक्षी समुदाय को हम, उनको प्रकृति द्वारा प्रदत्त कार्यों व पर्यावरण में उनके महत्व के अनुरूप वर्गीकृत कर सकते हैं।

## उदाहरणार्थ ;

### प्रकृति की सुन्दरता में वृद्धि करने वाले पक्षी:-

ये, वे पक्षी होते हैं जो वनों तथा उपवनों में रहकर उनकी सुन्दरता में चार चौद लगाते हैं जैसे मोर, मोनाल, चीड़, ट्रेगोपन, चकोर, शकरखोरा, हिमतीतर, स्केलैटर मोनाल, काला तीतर आदि।

### सुरीला गायन करने वाले पक्षी:-

कुछ पक्षी अपनी अत्यन्त सुरीली बोली से बाग-बगीचों और वनों को गुंजायमान करते रहते हैं इनकी बोली सुरीली व कर्णप्रिय होती है जैसे कोयल, बुलबुल, कस्वूय, श्यामा आदि।

### पेड़-पौधों के प्राकृतिक पुनरुत्पादन में सहायक पक्षी:-

पक्षी वनों में उगने वाले वृक्षों के बीजों को एक स्थान से दूसरे स्थान तक ले जाकर, उनके पुनरुत्पादन में सहयोगी होते हैं। पक्षी प्रायः वृक्षों के फलों का भक्षण करते हैं, जिनमें से कुछ प्रजातियों के बीजों का उपर का छिलका



बहुत ही कठोर होता है, ये बीज जब पक्षियों के उदर में जाते हैं तो उनकी आंतों में बीजों का कड़ा छिलका गल जाता है व बीज पक्षियों की बीट के साथ निकल कर भूमि पर गिरकर अकुंरित हो जाता है। पक्षी किस प्रकार हमारे पर्यावरण में कुछ वृक्षों के प्राकृतिक पुनरुत्पादन हेतु अत्यन्त आवश्यक है यह निम्न उदाहरण से स्पष्ट हो जाता है। हिन्द महासागर में स्थित एक राष्ट्र है, जिसका नाम मॉरीशस है। मॉरीशस में 16वीं सदी में कबूतर जाति का पक्षी डोडो पाया जाता था। हालैन्ड के निवासियों ने डोडों को 1598 में देखा था। हॉलैन्ड ने इस टापू पर अपना कब्जा कर लिया तथा भोजन हेतु डोडो का शिकार करता प्रारम्भ कर दिया। अन्धाधुन्ध शिकार के कारण 17वीं सदी के अन्त तक इस पक्षी का मॉरीशस से एकदम लोप हो गया था। डोडो तो लुप्त हुआ ही, इसके साथ ही कैलबेरिया मेजर जाति के पौधे भी उगना बन्द हो गये। कैलबेरिया के बीजों के ऊपर का छिलका बड़ा कड़ा होता है। डोडो को इसके फल पसंद थे, जब डोडो इनको खा जाता, उसकी आंत में इन बीजों का कड़ा छिलका गल जाता था जो उसकी बीट के साथ निकलकर धरती पर गिर जाता था तथा पौधा उग जाता था। परन्तु डोडो के समाप्त हो जाने पर कैलबेरिया वृक्ष भी समाप्त होते चले गये। स्थिति यहां तक खराब हो गयी कि 1970 तक मात्र 14 वृक्ष शेष रह गये। पक्षी पुष्पों के परागकणों को भी एक पुष्प से दूसरे पुष्प तक ले जाकर पुनरुत्पादन में सहायता करते हैं। इस श्रेणी में बड़ा घनेर, छोटा घनेर, बुलबुल, बारबेट आदि हैं।

### **वनों में हिंसक मांसभोजी जानवरों की उपस्थिति की चेतावनी देने वाले पक्षी:—**

कुछ विशिष्ट पक्षी वनों में निवास करने वाले तृणभोजी पशुओं, हिरन, बन्दर आदि को हिंसक व मांसभक्षी पशुओं जैसे सिंह, शेर, गुलदार, भेड़िया, रीछ, लोमड़ी आदि की उपस्थिति की पूर्व सूचना अपनी-2 बोली में देकर उनको सतर्क कर देते हैं व बहुधा शाकाहारी जीवों के प्राणों की सुरक्षा हो जाती है। ऐसे पक्षी मोर, झोंगो (भुजंगा), जंगली मुर्गा, बुलबुल, बैवलर, कौआ आदि हैं।

### **पर्यावरण में जैविक सन्तुलन बनाये रखने वाले पक्षी:—**

प्रकृति में जैविक सन्तुलन बनाये रखने वाले मांसभोजी पक्षी भी रहते हैं जो पर्यावरण की दृष्टि से अति महत्वपूर्ण हैं। ये पक्षी हैं गरुड़, चूहामार, बाज, चील, कौवे, उल्लू इत्यादि। विभिन्न जीवधारियों के अस्तित्व से प्रकृति में एक सन्तुलन बना रहता है। सभी जीवधारी एक दूसरे से किसी न किसी रूप में सम्बद्ध हैं यदि इनमें से किसी एक का भी लोप हो जाये तो पूरी श्रृंखला टूट जाती है और जैविक सन्तुलन बिगड़ जाता है। एक ही उदाहरण पर्याप्त है कृशकों की फसलों को नष्ट करने वाली टिड्डियों व कीट-पतंगों को मेंढक खा जाते हैं मेंढकों को सांप खा जाते हैं तथा सांपों को शिकारी पक्षी जैसे गरुड़, चील, उल्लू, बाज आदि खा जाते हैं। यदि हम किसी शिकारी पक्षी को नष्ट कर दें तो सांपों की आबादी बढ़ जायेगी और वे मेंढकों का सफाया कर डालेंगे, परिणाम यह होगा कि टिड्डियों व कीट-पतंगों की संख्या बढ़ जायेगी तथा फसलों की बरबादी हो जायेगी व अपार धन की हानि भी होगी।

### **पर्यावरण व प्रकृति के सर्माजक (स्वच्छकार) पक्षी:—**

कुछ पक्षी प्रकृति में सफाई कर्मियों का कार्य करने हैं ये मृत पशुओं के शवों का भक्षण कर हमारी पृथ्वी के पर्यावरण को प्रदूषण मुक्त रखते हैं, जैसे गिद्ध की सभी प्रजातियां, चील, कौवे, नीलकंठ तथा जलचर पक्षी आदि। इनका विशिष्ट योगदान प्रकृति में स्वच्छता बनाये रखने में कितना महत्वपूर्ण है। यह निम्न उदाहरण से ही स्पष्ट हो जायेगा। यदि हम भूमण्डल के सभी गिद्ध समुदाय को समाप्त कर दें तो वन्य तथा पालतू पशुओं के सड़ने-गलने शवों से फैली दुर्गन्ध व विषैले जीवाणुओं से फैले प्रदूषण के कारण पृथ्वी तुरन्त ही महामारी की चपेट में आ जायेगी व मानव जीवन की अकल्पनीय क्षति होगी। हमें प्रकृति के सर्माजक पक्षी विशेषकर गिद्धों के संरक्षण को हर हाल में करना ही होगा, क्योंकि आजकल हमारे पर्यावरण में गिद्धों की संख्या में निरन्तर कमी आ रही है, यह बहुत ही चिन्ताजनक व शोध का विषय है वास्तव में सभी सर्माजक पक्षी मानव जाति के परम सहायक हैं। भारत में लगभग 90 प्रतिशत गिद्ध समाप्त हो गये हैं।

### **वृक्षों के चिकित्सक पक्षी:—**

कुछ पक्षी वनों में उगे हुए वृक्षों के स्वास्थ्य की रक्षा करते हैं ये पक्षी वृक्षों के वनों में छिद्र बनाकर रहने वाले कीड़े-मकोड़ों का भक्षण करके वृक्षों को उनसे मुक्ति दिलाते हैं। ऐसे पक्षी माहरत्ता कठफोड़ा व सुनहरी पीठ वाला कडफोड़ा, लालपेट हिमालयी कठफोड़िया हैं।

### **मनुष्यों का मनोरंजन करने वाले पक्षी:—**

कुछ विशेष प्रजातियों के पक्षियों को मनुष्य ने प्राचीन काल से ही पालतू बना कर रखा है जो कि मानवों का मनोरंजन करने आये है। इस प्रकार के पक्षी मनुष्यों की बोली की भली भांति नकल कर सकते हैं जैसे तोता, मैना, काकातुआ आदि।

### **पोस्टमैन का कार्य करने वाले पक्षी:—**

मध्यकालीन भारत में कबूतरों द्वारा अत्यन्त गोपनीय व महत्वपूर्ण संदेशों को एक स्थान से दूसरे स्थान तक अल्प अवधि में पहुंचाने का कार्य सफलतापूर्वक पूर्ण किया जाता था। कबूतरों में अपने यात्रापथ को अपनी स्मृति में सजाये रखने की विलक्षण शक्ति होती है। ये कभी भी अपने मार्ग से भटकते नहीं हैं।

### **जलाशयों व सरिताओं को प्रदूषण मुक्त रखने वाले पक्षी:—**

सभी जलचर पक्षी, नदी-नलों, पोखरों, जलाशयों के पर्यावरण की स्वच्छता तथा साफ-सफाई लगातार करते रहते हैं। ये पक्षी पानी में बहने वाले मृत पशुओं, मनुष्यों के शवों का भक्षण करते हैं तथा मछलियों की संख्या को भी नियन्त्रित करते हैं। इस प्रकार जल का शुद्धीकरण कार्य अनवरत गति से चलता रहता है। इस श्रेणी में बगुले, सारस, पेलिकन, बतखें की सभी प्रजातियां, हंस, मुर्गाबी, हेरोन आदि आती हैं।

### **प्रवासी पक्षी:—**

प्रकृति का यह अत्यन्त गूढ़ रहस्य मानव के लिए एक पहेली बना हुआ है कि क्यों कुछ पक्षी वर्ष में दो बार बसन्त तथा शरद ऋतु में हजारों मील की यात्रा कर भारत व अन्य एशियाई देशों में बसेरा करने आते हैं। साइबेरिया से साइबेरियन क्रेन व पेलिकन, चीन से कूट पक्षी, यूरोप से हेरोन, मध्य एशिया से रोजी पेस्टर भारत आते हैं। शीत ऋतु में प्रायः सभी यूरोपीय देशों में बहुत बर्फ गिरती है तथा सर्दियाँ ज्यादा लम्बी होती हैं। पक्षियों को वहां पर खाने के लिए खाद्य पदार्थ उपलब्ध नहीं होते हैं अतः अपने भोजन की खोज व सन्तति के प्रजनन पोषण हेतु वे प्रवासी पक्षी देशान्तरण (प्रवासन) पर भारत तथा दक्षिणी पूर्वी एशिया के देशों में आते हैं। भारत में प्रवासी पक्षी राजस्थान में केवलादेव घाना पक्षी बिहार, हरियाणा में सूरजकुण्ड, उत्तराखण्ड में भीमगोड़ा, बैराज, आसन झील, तुमरिया जलाशय, उत्तरप्रदेश की झीलों व तालाबों में अपना रैन बसेरा बनाते हैं। यह पक्षी जीवन का अत्यन्त विस्मयकारी तथ्य है कि आर्कटिक टर्न नामक पक्षी प्रतिवर्ष लगभग 35000 कि०मी० की आने जाने की यात्रा करके उत्तरी ध्रुव से अन्टार्कटिका तक का प्रवासन करता है। कुछ पक्षी ऐसे भी हैं जो मानव शिशुओं के साथ प्रेम, कौतुहल व नम्रता के साथ क्रीड़ा करते हैं जैसे कोयल, कौआ, मैना आदि। ये पक्षी मानव शिशुओं के समीप चले जाते हैं, जब बच्चे इन पक्षियों को पकड़ने के लिए इनके पास जाते हैं तो ये पक्षी उड़ कर थोड़ी दूर चले जाते हैं और पुनः शिशुओं के पास चले आते हैं। यह क्रीड़ा बहुत देर तक चलती रहती है।

इस प्रकार हम समझ सकते हैं कि प्रकृति के आंगन में उड़ने वाले पक्षी किस प्रकार पृथ्वी के पर्यावरण के सन्तुलन को स्थिर रखने में अपना-अपना विशिष्ट योगदान प्रदान करते हैं तथा मानव जीवन की सहायता भी करते हैं। वास्तव में सम्पूर्ण खग जीवन अत्यन्त विलक्षण व रहस्यपूर्ण हैं। प्रकृति के अनुपम उपहारों में से एक इन पक्षियों के रोमांचक व कलात्मक जीवन को देखकर हम मानव दंग रह जाते हैं। पक्षी समुदाय भी सामाजिक प्राणी की तरह रहते हैं।

यह अत्यन्त दुःख की बात है कि प्राकृतिक आवासों का विनाश, गैर कानूनी शिकार तथा पक्षियों को फंदों द्वारा फंसाने वाली गतिविधियों के कारण अनेक पक्षियों की प्रजातियों को विलुप्ति के कगार पर खड़ा कर दिया है। दीपावली के पर्व पर अनेक मनुष्यों द्वारा काले जादू तथा अन्य तांत्रिक क्रियाओं को करने हेतु उल्लू की अनेक प्रजातियों की बलि दी जाती है। ऐसी प्रथाओं की निन्दा करनी चाहिए।

अतः प्रत्येक सभ्य व विवेकशील मनुष्य को पक्षियों के संरक्षण में अपना योगदान प्रदान करना चाहिए।

## हाथी मेरा साथी !!

नरेन्द्र सिंह

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भारत में हाथी एक बहुत लोकप्रिय प्राणी है। भारत और हाथी एक दूसरे के पर्याय माने जाते हैं। हम ऐसे भारत की कल्पना नहीं कर सकते जिसमें हाथी ना हों। जम्मू-कश्मीर, पंजाब व हिमाचल प्रदेश को छोड़कर भारत के लगभग प्रत्येक भाग में हाथी विद्यमान हैं। भारत की संस्कृति एवं प्रकृति में हाथी का एक विशिष्ट स्थान है।

हाथी दो प्रकार के होते हैं। एक अफ्रीकी हाथी और दूसरा एशियाई या भारतीय हाथी। अफ्रीकी तथा एशियाई हाथी दो भिन्न प्रकार के समूह हैं तथा एक ही प्रजाति के अनुवंशी नहीं हैं। दोनों अलग-अलग वंश में रखे गये हैं। अफ्रीकी हाथी लोक्सोहोण्टा प्रजाति है तथा एशियाई हाथी एलिफस प्रजाति है। मैमथ की कहानी एक मछुआरे से जुड़ी है। टंगोसिया का शुभाचौक नाम मछुआरा 1799 में लीना नदी में मछली के शिकार में सफलता न मिलने के कारण मैमथ के दांतों को ढूँढ रहा था कि उसने बर्फ में एक मैमथ फंसा हुआ देखा, काफी समय के बाद उसने मैमथ के दांत तो किसी तरह चुरा लिए और शेष ढाँचे को वहीं छोड़ दिया जिसका मांस तो गीदड़ और भालू खा गए, परन्तु हड्डियों का ढाँचा किसी वैज्ञानिक को मिल गया जिसके दांत 8 फुट लम्बे थे। हाथी की बनावट बड़ी विचित्र है। यह कौतूहल का विषय है।

### विशालकाय तन

हाथी को वर्तमान रूप में आने में करोड़ों वर्ष लगे। हाथी की बनावट भू-मध्यसागरीय जलवायु में गुजर-बसर करने के लिए पूर्ण रूप से अनुकूल है। हाथी की बनावट उष्णबन्धीय जलवायु में क्रमशः होने वाले भीषण सूखे व अत्याधिक वर्षा को बर्दाश्त करने के लिए अनुकूल है। एक अफ्रीकी नर हाथी की ऊँचाई 13 फुट तक व भार 6 टन तक हो सकता है अतः जिस जन्तु का आकार इतना भारी भरकम हो उसे अपने अस्तित्व के लिए उसी तरह से तैयार भी रहना होगा। हाथी के पैर पाँव, नाक, कान व दांतों की बनावट बड़ी विचित्र है जो उसे चलने, खाने-पीने व ठंडा रखने में मदद करती है।

### हाथी के पाँव में सबका पाँव

हाथी के पैर अपनी स्थिरता के लिए जाने जाते हैं। हाथी के अगले पाँव स्तम्भ के आकार के होते हैं। उनकी बनावट कुछ ऐसी होती है कि ऐसा भ्रम होता है कि उनमें कोई जोड़ है ही नहीं। हाथी का पाँव जहाँ स्टील के स्तम्भ जैसा देखने में हैं वहीं इतना ही लचीला भी है। उसमें भी अन्य स्तनपायों की तरह कंधे, घुटने व टखने के जोड़ होते हैं। विशेषता टखने में होती है जो अन्य जीवों की अपेक्षा काफी पीछे होता है तथा घुटने व जहाँ टखने के होने की सम्भावना है इस स्थान से लगभग आधी दूरी पर होता है। हाथी के पैर के सम्बन्ध में एक रोचक तथ्य है कि इसके पैर की नीचे की परिधि की माप का दुगना कर दें तो वह इसकी ऊँचाई के बराबर होती है।

हाथी के पाँव की दूसरी विशेषता यह कि वह पंजो पर चलता है। अंगठों की हड्डियाँ जमीन की तरफ झुकी रहती हैं और वे गद्दे की तरह पैद में धंसी रहती हैं। यह गद्दी हाथी के वजन से पड़ने वाले झटकों को सहन करता है। अफ्रीकी हाथी के अगले पाँव में चार तथा पिछले में तीन नाखून होते हैं जबकि एशियाई हाथी के अगले पैर में पाँच व पिछले पैर में चार नाखून होते हैं।

### कौतूहल का विषय-हाथी की सूंड

हाथी सूंड सभी के लिये कौतूहल का विषय है। यह हाथ का कार्य करती है, सम्भवतः इसी कारण इसका नाम हाथी पड़ा है। वास्तव में हाथी की सूंड बड़ी हुई नाक मात्र है। 6 करोड़ वर्ष पूर्व हाथी के पूर्वज जो छोटे साधारण जीव थे, की सूंड नहीं होती थी। इनकी नाक साधारण जीवों की तरह होती थी। आरम्भ में हाथी जैसे भारी भरकम जीव की नाक का आकार उसकी आवश्यकता के अनुरूप बढ़ता गया क्योंकि इतने बड़े सिर के लिये सीधे जमीन से चारा लेना सम्भव नहीं था। यदि सिर जिराफ की तरह होता है या हल्का होता तो गर्दन बढ़ती परन्तु भारी भरकम सिर के कारण मांस पेशियाँ जुड़ती गईं और नाक सूंड का आकार धारण करती गई ताकि सिर शरीर के ढाँचे के साथ जुड़ा रहे। 3-5 करोड़ वर्ष प्रकृति के सिद्धान्त से हाथी की सूंड ने वर्तमान रूप धारण किया ताकि वह अपना भोजन आसानी से ग्रहण कर सकें। आरम्भ से इस प्रजाति के जीव दलदली जमीन में रहते थे और उनका निचला होंठ बड़ा था ताकि वे दल-दल से काई आदि एकत्र कर सकें। परन्तु सूखी जमीन पर पहुंचने के बाद सूंड की आवश्यकता बढ़ गई और निचला जबड़ा छोटा हो गया तथा ऊपरी जबड़ा व नाक मिलकर सूंड के आकार में बढ़ गए ताकि वह शुष्क स्थानों पर भी जा सकें। पिछले लगभग दस लाख वर्षों में हाथी की सूंड अपने वर्तमान बहु-उपयोगी स्वरूप में पहुंच पाई।

हाथी की सूंड मुख्यतः ऊपरी होंठ तथा नाक का बड़ा हुआ सम्मिलित रूप है। अफ्रीकी तथा एशियाई हाथी की सूंड में एक ही अन्तर है कि अफ्रीकी हाथी के सूंड के सिर पर दो अंगुलीनुमा आकार होते हैं - एक ऊपर व एक नीचे। जबकि एशियाई हाथी की सूंड के सिरे पर मात्र एक ही आकार होता है जो ऊपर की ओर होता है।

हाथी सूंड बहुआयामी कार्य करती है। हाथी की सूंड पांचवे अंग की तरह कार्य करती है। सूंड अत्याधिक लचकदार होती है। चूंकि



इसमें कोई हड्डी नहीं होती है। इतना भारी-भरकम जानवर बिना सूंड के जीवित नहीं रह सकता है जो इसके भोजन और पानी का अद्वितीय साधन है। सूंड की मदद से यह पेड़ों व झाड़ियों से टहनियां व पत्ती जमीन से घास एकत्र करके अपने मुंह में ठूसता है और इसी से पानी चूसकर एक बार में एक बाल्टी (5 से 6 लीटर) गले में उड़ेलता है।

सूंड के अन्य भी कार्य हैं। सूंड का जो भी आकार व बनावट हो मूलतः यह एक नाक है। नाक के दो सुर सूंड के अग्र भाग पर स्थित होते हैं जो सिर से आठ फुट दूर होते हैं तथा सूंड की पूरी लम्बाई में जाते हैं। लम्बाई में नाक के दो सुर मांस की दीवार से अलग-अलग रहते हैं। हजारों की संख्या में अलग-अलग मांसपेशियां इसी नाक की नली के इर्द-गिर्द बनी रहती हैं ताकि सूंड को किसी भी दिशा में घुताया या मोड़ा जा सके। इस तरह के अंग से हाथी हवा में अन्य हाथियों या दुश्मनों की गंध लेता है। हाथी की दृष्टि बहुत अच्छी न होने के कारण वह सूंड से ही सूंघने एवं आस-पास का जायजा लेने तथा सेन्सर का कार्य करता है।

सूंड की लम्बाई आस-पास की हवा में गंध लेने में मदद करती है। हाथी अक्सर सूंड ऊंची करके गंध प्राप्त करते हैं ताकि जमीन की गंध से उसे कोई भ्रम न हो। लम्बी सूंड से हाथी अलग-अलग प्रकार की ध्वनियां भी उत्पन्न करते हैं और आपस में संकेत देते हैं, धीमी व मधुर आपस में एक दूसरे से मेल-जोल करने के लिये तथा तेज या लम्बी ध्वनि दुश्मन की उपस्थिति को सूचित करने के लिये उत्पन्न की जाती है। हाथी जब भी तेज आवाज करें तो मनुष्य को सावधान हो जाना चाहिए चूंकि जब भी कोई हाथी सूंड ऊंची करके आदमी या गाड़ी की तरफ भागे तो खुं मैदान पकड़ सकता है।

गर्मी में सूंड से बदन को ठंडक पहुंचाने में मदद मिलती है। सूंड से बदल पर पानी भी उड़ेलता है। गहरे पानी में हाथी सूंड के आखिरी सिरे को पानी से बाहर रखकर देर तक पानी में रह सकता है। सूंड से हाथी धूल तथा मिट्टी बदल पर बिखेरता है ताकि मक्खी, मच्छर से बचाव हो सके।

हाथी की सूंड शक्ति एवं कोमलता की एक अद्वितीय उदाहरण है। उसी सूंड से लकड़ी के लट्ठों को उठाना व बड़ी-टहनियों को तोड़कर रास्ते से हटाना तथा उसी से पेड़ की किसी पत्ती को इस तरह तोड़ना कि टहनी हिल भी न पाये। जब हाथी एक दूसरे से किलोल करते हैं तो इसकी नाजुक ढंग से सूंड का इस्तेमाल करते हैं। इसी सूंड से यह अपने बच्चों को सहारा देते हैं, खेलते हैं तथा सूंड को परिपक्व बनाते हैं।

## पंखेनुमा कान

हाथी के कान बड़े पंखे की तरह होते हैं। अफ्रीकी व एशियाई हाथियों को तत्काल उनके कानों से ही पहचाना जाता है। सूंड का अग्रभाग शरीर की बनावट तथा टस्क की बनावट से भी इन दोनों प्रजातियों में अन्तर किया जाता है। दोनों प्रजातियों की श्रवण शक्ति तेज होती है। अफ्रीकी हाथी के कान बड़े होने के मायने यह नहीं कि उसकी श्रवण शक्ति अधिक है। कान का मुख्य कार्य ध्वनि को मस्तिष्क में पहुंचाना है। कान का बाहरी जिसे पाखा कहते हैं ध्वनि तरंगों को पकड़ना है जिन्हें मस्तिष्क तक पहुंचाया जाता है जहां उनका विश्लेषण किया जाता है।

हाथी के कान का आकार एवं क्षेत्रफल शरीर के तापक्रम को व्यवस्थित करने के लिये आवश्यक है। प्रत्येक कान के निचले भाग में रक्त कोशिकाएं पंखानुमा आकार में होती हैं जो खाल के ठीक नीचे दौड़ती हैं। जब गर्मी अधिक होती है तो हाथी के शरीर की गर्मी वाली गहराइयों से खून कान की इन कोशिकाओं से दौड़ता है और आस-पास की हवा से ठण्डा होने वाले वापस चला जाता है। हाथी जब कान हिलाता है तो यह प्रक्रिया और तेज हो जाती है। कान के पास होने वाले खून व शरीर के खून में 96 डिग्री फॉरेनहाइट तक का अन्तर पाया गया है। हाथी के कान के छोर उम्र के साथ कटे-फटे नजर आते हैं परन्तु जब तक उक्त कोशिकाएं ठीक रहें तब तक इसमें कोई अन्तर नहीं आता है।

इसके अलावा हाथी अपने कानों से अपनी सुरक्षा भी करता है। दुश्मन के आगे वह कानों को बड़ा करके उसका अग्रभाग काफी बड़ा हुआ नजर आता है और दुश्मन उस पर आक्रमण करने की हिम्मत नहीं जुटा पाता है। जैसे गुस्से से बिल्ली अपने बाल खड़े कर लेती है या पक्षी अपने पंख उठा लेते हैं उसी तरह हाथी अपना कान खड़ा करता है। हाथी जब कान खड़े करते हैं तो उसके सिर के अग्रभाग का आकार लगभग तीन गुना नजर आता है, जो दांतों के साथ डरावना लगता है। वैसे भी हमें आक्रमण मुद्रा के समय हाथी से एक सुरक्षित दूरी बनाकर ही रहना चाहिए।

## हाथी के दांत खाने के और -दिखाने के और

हाथी के दांत बड़े अनोखे होते हैं। ऊपरी कुर्तक का दांत में परिवर्तन होने के अलावा हाथी की उम्र का अन्दाजा भी दांतों से लगाया जा सकता है। सुमात्रा की उपजाति के अतिरिक्त सभी हाथी प्रजातियों में टस्क होते हैं। अफ्रीकी हाथी में दांत नर व मादा में स्पष्ट होते हैं जबकि एशियाई हाथी में नर में ही स्पष्ट होते हैं और छोटे भी होते हैं। टस्क दांतों का ही परिवर्तित रूप है। एक कुर्तक है न कि कीले। ये ऊपरी जबड़े में होते हैं और निचले में होते ही नहीं। प्रत्येक जबड़े में एक-एक अर्थात् 4 सैट होते हैं। मोलार से ही चबाने, पीसने का काम

होता है।

हाथी दूध के टस्क के साथ जन्म लेते हैं जो एक वर्ष में 'वास्तविक टस्क' में परिवर्तित हो जाते हैं। वास्तविक टस्क आइवरी के बने होते हैं। आइवरी दांत की हड्डी व कर्टिलेज से ढका रहता है। यह टिकाऊ मिश्रण है और यही हाथी के विनाश का भी कारण बन गया है। जन्म के एक वर्ष से ही टस्क बढ़ने लगते हैं। अफ्रीकी हाथी में नर के दांत अधिक मोटे व लम्बे होते हैं। टस्क से हाथी की उम्र का पता चलता है। जिन नर हाथियों के किसी कारणवश टस्क नहीं होते हैं उन्हें 'मकना' कहते हैं। टस्क लड़ने, मिट्टी खोदने, पेड़ों की छाल नोचने व अन्य कार्यों में प्रयोग किये जाते हैं जिससे वे टेढ़े-कटे-फटे भी हो सकते हैं। टस्क की लम्बाई  $1/3$  भाग खोपड़ी के अन्दर होता है।

हाथी में कुर्तुक दांत तो टस्क बन जाते हैं और कैनाइन होते ही नहीं हैं। केवल मोलर दांत होते हैं। हाथी भोजन पचाने में कमजोर माना जाता है। चूंकि जितना ग्रहण करता है उसका 45 प्रतिशत ही पाचन क्रिया में काम आता है। उन्हें प्रतिदिन 15-16 घण्टे से अधिक समय तक चरना पड़ता है। जितना घास, टहनी, पत्ती हाथी को खाना पड़ता है अगर एक ही सैट दांतों का हो तो वह शीघ्र की घिस कर समाप्त हो जाएगा। प्रकृति ने हाथी के दांतों का विशेष प्रबन्ध किया है ताकि वह कई वर्ष तक वनस्पति को चबाने का कार्य करता रहे।

हाथी के ऊपरी व निचले जबड़ों में चौड़े सपाट मोलर दांतों का एक-एक सैट होता है। इन चारों स्थानों पर प्रत्येक पर मोलर के 6 सैट होते हैं ताकि सभी मिलकर 24 सैट हो जायें परन्तु सभी एक साथ नहीं आते परन्तु एक-दूसरे के श्रृंखला में आते रहते हैं। एक सैट कुछ वर्ष चलता है और जैसे ही एक सैट पुराना हो जाय और टूटने लगे तो पीछे से एक दूसरा सैट उनके स्थान पर आ जाता है। अगला सैट पिछले से बड़ा होता है ताकि बड़े हुए जबड़ों में फिट हो जाय।

## नारी प्राधान सामाजिक-जीवन

हाथी मादा प्रधान समूह में रहते हैं। सभी मादाएँ, छोटे नर व बच्चे एक साथ छोटे-बड़े समूह में रहते हैं और भोजन की उपलब्धता के आधार पर ग्रुप छोटे-बड़े होते रहते हैं। बुजुर्ग मादा ग्रुप का संचालन करती हैं जो अपने अनुभव से ग्रुप को जाने-पहचाने रास्तों से एक फीडिंग ग्राउण्ड से दूसरे में ले जाती हैं। बल्कि इन्हें खतरों से भी आगाह करती हैं। पानी की उपलब्धता महत्वपूर्ण है। पानी की उपलब्धता हो तो ऊँचाई वाले (1000 मीटर) स्थानों तक चले जाते हैं। विशेषकर बांस खाने व मक्खियों से बचने के लिए बड़े नर, झुण्ड में कभी सम्मिलित हो जाते हैं तो कभी अकेले भ्रमण करते हैं। नर समूह में सहवास के लिये आते हैं तथा ईष्यावश लड़ जाते हैं। अकेले नर कठिन स्थानों से होते हैं हुए एक समूह से दूसरे समूह में जाते रहते हैं, जिससे अन्तर्गर्भाधान नहीं होती। रात्रि में तथा सुबह-शाम खुले में तथा दिन में गर्मी व धूप से घनी छाया में आराम करते हैं। अधिक गर्मी में पानी में नहाते हैं व अधिक समय पानी में बिताते हैं। एक नर हाथी 200 से 300 कि०ग्रा० तक चारा एक दिन में खाता है तथा 100 से 160 लीटर पानी पीता है। गर्भकाल 18 से 22 माह का होता है। वर्षभर प्रसव होता रहता है। बच्चा जन्म के समय लगभग 100 कि०ग्रा० वजन का होता है जो लगभग एक वर्ष तक माँ के दूध पर पलता है। बच्चों की देख-रेख न केवल माँ बल्कि अन्य मादाएँ भी ध्यान से करती हैं। गर्भवती मादा जन्म देने से पूर्व कोई सहेली बना लेती है जो प्रसव के समय व उसके बाद मादा की मदद करती है व बच्चे की देखभाल भी। भोजन की कमी होने पर छोटे-छोटे ग्रुप यहां तक कि 3 से 5 तक का भी हो सकता है। बड़ी उम्र की मादाएँ ग्रुप की सुरक्षा का पूरा ध्यान रखती हैं।

## कितने हाथी ?

जंगली एशियाई हाथियों की कुल अनुमानित संख्या 35000 से 60000 के बीच है जो अफ्रीकी हाथियों की संख्या का कुल लगभग एक दसवां हिस्सा है। भारत में जंगली हाथियों की संख्या लगभग 28000 है। इसके अतिरिक्त हाथी बांग्लादेश, भूटान, म्यांमार, कंबोडिया, चीन, इण्डोनेशिया, लोओस, मलेशिया, नेपाल, श्रीलंका, थाईलैण्ड, विएतनाम में भी पाए जाते हैं। इसके अलावा 16000 पालतू हाथी भी हैं जो म्यांमार, भारत, थाईलैण्ड, विएतनाम व कंबोडिया में मुख्यतः लकड़ी ढुलान के काम में लगाए जाते हैं। भारत में लगभग 3500 पालतू हाथी हैं जो पूर्व राजाओं, मन्दिरों तथा आश्रमों में पाये जाते हैं। भारत में जंगली हाथी प्रतिवर्ष लगभग 200 व्यक्तियों को मौत के घाट उतारते हैं और करोड़ों रुपये की फसल भी बर्बाद करते हैं। साथ ही बस्तियों में भवनों को भी क्षतिग्रस्त कर देते हैं।

उत्तराखण्ड में हाथी मुख्यतः यमुना से शारदा के बीच तराई-भाभर क्षेत्र में पाए जाते हैं। कॉर्बेट पार्क, उसके बफर व आस-पास के जंगलों में लगभग 500 हाथी होने का अनुमान है। राजाजी पार्क व आस-पास के क्षेत्रों में भी लगभग 500 हाथी हैं उत्तराखण्ड में कुल 1000 से 1500 तक हाथी हैं। तराई के वनों में यमुना से शारदा तक कुछ समय पूर्व हाथी स्वतंत्र रूप से विचरण करते थे परन्तु शहरों के विस्तार, नहरों के निर्माण, सड़कों आदि के बनाने से यह संख्या तीन हिस्सों में बंट गई है। राजाजी व कॉर्बेट के बीच तथा गंगा नदी के दोनों ओर हाथियों के आवागमन के लिए कोरिडोर बनाने पर काफी समय से विचार किया जा रहा है परन्तु इसमें अनेक बाधाएँ आ रही हैं।

मोतीचूर-चीला, लैन्सडौन वन प्रभाग का कण्वाश्रम एवं टूटगधेरा हाथी गलियारा प्रमुख है जहां पर इनका निबाध आवागमन आवश्यक है।

## हाथी का मानव से टकराव

जंगली हाथियों के वास स्थलों के बर्बाद होने तथा उन वास स्थलों पर पालतू पशुओं और मनुष्य का दबाव बढ़े के कारण जंगली हाथियों को चारे की खोज में दूर-दूर भटकने को बाध्य होना पड़ता है। पिछले कुछ दशकों में मोनोकल्चर वृक्षारोपणों का बड़े पैमाने पर विकास होने से भी हाथियों को चारे के लिये भटकने के लिये मजबूर होना पड़ा है। जब जंगली हाथी बस्तियों के आस-पास पहुंचते हैं तो फसलों की क्षति तथा कभी-कभी जान-माल की क्षति भी हो जाती है जिससे हाथी-मानव टकराव उत्पन्न हो जाता है। जंगली हाथियों की छोटी-छोटी संख्या कोरिडोर के अभाव में दूरस्थ आवागमन कठिन हो गया है जिस कारण उन्हें बस्तियों से होकर जाने के लिये मजबूर होना पड़ता है। पिछले लगभग 10 वर्षों में उत्तराखण्ड में लगभग 50-60 लोगों को जंगली हाथियों द्वारा मारा गया तथा अनेक व्यक्तियों को घायल किया गया। फसलों की क्षति भी हर वर्ष आस-पास के गांवों में होती रहती है। भारत सरकार द्वारा वर्ष 1991 से पूरे भारत में हाथी बाहुल्य रिजर्व चिन्हित किए गए हैं। भारत में हाथियों के वास स्थल लगभग 780000 वर्ग कि०मी० में फैला है। उत्तराखण्ड में तराई भाग के वनों में शिवालिक हाथी रिजर्व बनाया गया है।

हाथी का संरक्षण उसके प्राकृतिक के सघन संरक्षण एवं प्रबन्धन से ही सम्भव है। इसके लिये सुघड़ रणनीति एवं न सहयोग आवश्यक है। सभी पक्षों के एक साथ बैठकर ऐसे प्रयोग एवं कार्यक्रमों के साथ एक दीर्घकालीन हाथी नीति की आवश्यकता है जिससे हाथी को सुरक्षित एवं संरक्षित किया जा सके।

सम्पत्ति : [nfornature7@rediffmail.com](mailto:nfornature7@rediffmail.com)



Elephant

Mansoor Mazhar



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## MEMBERSHIP FORM

# THE WILDLIFE PRESERVATION SOCIETY

(Established 1958)

Heritage Apartments, Flat No. 2, First Floor, 18 New Road, Dehra Dun. 248001

I.....hereby apply to be admitted as a

Life/Annual/Affiliated/ Institutional/ Student of the Wildlife Preservation Society.

My details are given below: -

Name.....

Address.....

.....

Phone No. with STD Code ..... Mobile No.....

WhatsApp No .....

Email .....

Date of Birth ..... Married/Single .....

Hobbies and Interest .....

Any Conservation work done.....

I am attaching the copy of Aadhar card herewith.

I hereby affirm and assure that I shall abide by the rules and regulations and constitution of WPS. I shall not do anything contrary to the ethics of wildlife conservation and do whatever possible at my end, to uphold the dignity of the society and discharges my duty to save and conserve wildlife and its habitat. I declare that there is no criminal case against me.

possible at my end, to uphold the dignity of the society and discharges my duty to save and conserve wildlife and its habitat. I declare that there is no criminal case against me.

**Applicant's Signature** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Recommended by** 1.....  
(Preferably Life member of WPS) 2.....

**Approval of members screening committee (minimum three) & comments:**

1. Name.....

Signature.....

2. Name.....

Signature.....

3. Name.....

Signature.....

4. Name.....

Signature.....

5. Name.....

Signature.....

**Date :** .....



## METHODOLOGY FOR WRITE UP & SUBMISSION OF PAPERS

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The abstract is to be in fully-justified italicized text as it is here, below the author information. Use the word “Abstract” as the title, in 12-point Times New Roman, bold-face type, centered relative to the column, initially capitalized. The abstract is to be in 11-point, single-spaced type, and may be up to 3 in. (18 picas or 7.62 cm) long. Leave two blank lines after the abstract, and then begin the main text. All manuscripts must be in English.

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Please follow the steps outlined below when submitting your final draft to the Editorial Board, WPS. These guidelines include complete descriptions of the fonts, spacing, and related information for producing your proceedings manuscripts. Please follow them and if you have any questions, direct them to the production editor in charge of your journal at the WPS,.

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Author names and affiliations are to be centered beneath the title and printed in Arial 12-point, non-boldface type. (See example below)

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*Affiliations are centered, italicized, not bold. Include e-mail addresses if possible.*

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Author<sup>1</sup>, Author<sup>2</sup> and Author<sup>3</sup>

<sup>1</sup>*Affiliation*

<sup>2</sup>*Affiliation*  
<sup>3</sup>*Affiliation*  
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Place tables as close as possible to the text they refer to and aligned center. A table is labeled *Table* and given a number (e.g., **Table 1.**) it should be numbered consecutively. The table label and caption or title appears 12pt space above the table, 6pt space after the text or paragraph if any; it should be uniform fonts and font size, and use 11pt font size and Helvetica style, capitalized similar to paper title, aligned center and bold face. Sources and notes appear below the table, aligned left. All tables must be in portrait orientation.

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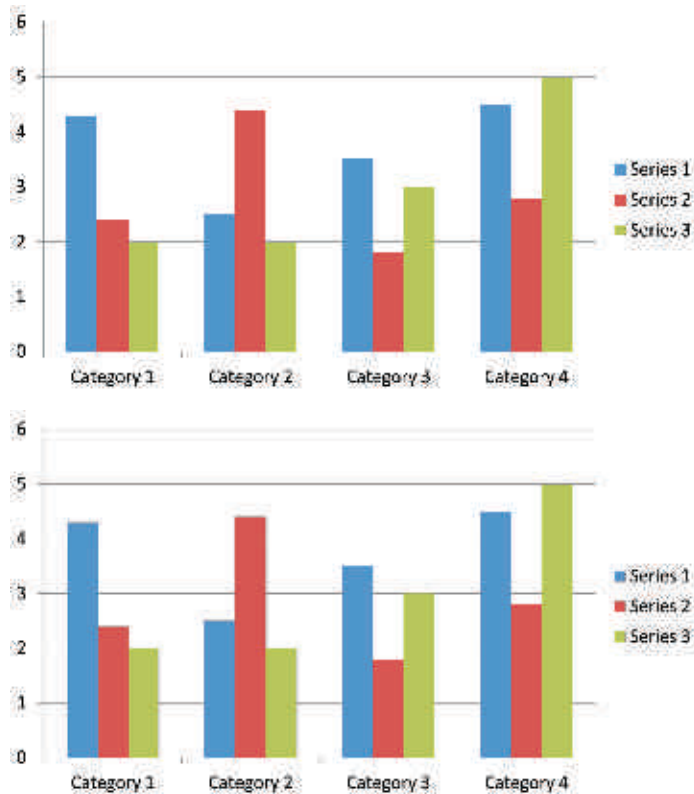
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List and number all bibliographical references that has important contribution on the paper, (if possible, limit to 30, which only are necessary citations are recommended). 9-point Arial, fully justified, single-spaced, at the end of your paper. When referenced in the text, enclose the citation number in square brackets, for example [1]. Do not abbreviate the months. Don't forget to put period (.) at the end of each reference. (**See examples below**)

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1. The aims and objects of the Society are as follows:-

- a) To promote interest and impart knowledge regarding the preservation and conservation of all forms of wildlife, particularly among the youth of the country.
- b) To cooperate with the Govt. of India and State Governments and with others Societies and institutions having similar aims and objects in working for the interests of wildlife.
- c) To assist in enforcing and actively supporting the Forests Acts. Wild Birds and animals Protections Acts and Rules etc of State Governments and the Indian Arms Act and Rules in so far as they pertain to wildlife and to bring to the notice of the authorities any infringement of the same and to assist in the detention and prosecution of offenders in respect of such laws.
- d) To advise and help the Govt. and wildlife administrators in the formation, maintenance and protection of Sanctuaries and National Parks, preservation of wildlife in general and endangered species of India in particular and in the introduction of exotic species into the country, rehabilitation of endangered species etc. and in the formulation and amendments of rules and acts, so to conserve and increase wildlife stocks.
- e) To raise funds for carrying out the above aims and objects and to found and maintain museums reading rooms and libraries of natural history in order to disseminate knowledge regarding wildlife.
- f) To carry out publicity and propaganda for the preservation of wildlife in India by means of monographs, journals, films, filmstrips and other feasible methods.
- g) To assist members of the Society in obtaining facilities for viewing and photographing wildlife in India.
- h) To conduct research into the problem of Wildlife management in India, and in pursuance of this, to initiate, encourage and, where possible assist in the projects of the study of threatened species and related objects and to provide reference and research facilities for such work.
- i) To carry on such other activities which will serve the above subjects?

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7. You will be supplied "Cheetal", the journal of the society free.

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